THE BUILDER

Incorporating ARCHITECTURE & THE BRITISH ARCHITECT

Vol. CXCIII September 6 1957 No. 5971

PUBLISHED FROM 'THE BUILDER' HOUSE, Catherine-street, Aldwych, London, WC2. *Telephones:* Temple Bar 6251-2-3-4. *Annual subscription:* £4; for six months £2. Single copies (including back numbers up to 12 months old) 1s. 6d. (post paid 1s. 10d.). Back issues more than 12 months old 2s. 6d. (post paid 2s. 10d.). *Indices* are produced in July and January each year; copies are sent free on application.

NEWS SUMMARY

HOW SCHOOL building costs have been kept down in the past 10 years is described in a MoE pamphlet. p. 399

EXCHANGE VISITS between Russian and British town planners have been arranged. p. 405

A REVIEW of planning rules and regulations to 'give more scope for progressive design' was suggested by Mr. Sheppard Fidler, at the Town and Country Summer School. p. 409

AGREEMENT has been reached on a standard international form of civil engineering contract. p. 413

FIRM PRICE tendering in Scotland is running into new difficulties. p. 414

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'BUILDING AS A PUBLIC SERVICE'

IN recent years there has been little mention of the nationalisation of the building industry. As a Labour Correspondent points out in an article in this issue, the advent of a Conservative Government made the question little more than academic, and the Labour Party has not proposed the nationalisation of the industry in any of its recent policy statements. The National Federation of Building Trades Operatives, however, have now returned to the attack with the publication of a pamphlet entitled 'Building as a Public Service.' In this pamphlet the NFBTO revive the proposal which they formulated some years ago—namely, that a National Building Corporation should be set up which would take over all but the smallest firms in the industry. Local authorities and large firms such as ICI would be allowed to retain their direct labour departments, but otherwise a large part of the contracting industry would be vested in a gigantic State monopoly. Apparently, the materials side of the industry would also be nationalised.

The title of the NFBTO pamphlet is significant. It is clearly indicative of the mental approach of the Union leaders, the obvious implication being that private ownership of industry and the profit motive are incompatible with service to the public. But is this true ? Is the business man's desire for financial profit any different in principle from the operatives' demand for wages ? We think not. Of course, short-sighted employers can put profit before service to the public—but so does a trade union if it presses a wage claim beyond what is reasonable.

The real question surely is whether the industry would serve the public better if taken over by the State. The NFBTO pamphlet roundly asserts that nationalisation is a more efficient method than private enterprise, and in support of this we are told that the new State Corporation would 'eliminate the present excessively wasteful tendering system and install in its place the method of fixed prices.' Whatever this may mean, one thing is clear : the building owner would not have the advantage of competitive prices ; he would simply have to take or leave the price quoted by the Corporation. Local authorities would, to some extent, be safeguarded in that they would apparently be able to use their direct labour departments if they thought the Corporation's tender unreasonable. But everyone else would virtually be at the mercy of the Corporation. The NFBTO may perhaps say that the Corporation's prices would always be reasonable since it would have no financial incentive to overcharge. But there are two reasons why this argument will not do. First, tendering is a highly skilled job—as witness the fact that a selected list of firms, equally inspired by the profit motive, will often tender very different prices for the same contract. Second, there are worse things than the profit motive. A monopoly, however well intentioned, can become bureaucratic and lazy-minded. In a period of rising prices and wages, it can all too easily succumb to the temptation simply to pass on rising costs to the public ; some of the present nationalised industries appear to do this all too readily. Admittedly, the present tendering system is sometimes wasteful, but that can be eliminated by the extension of selective tendering—though, oddly enough, it is the local authorities who insist most of all on free-for-all tendering. To abolish competitive tendering altogether would be to remove the public's one guarantee of reasonable prices.

It is scarcely surprising that the NFBTO should make the most of the evidence of monopolistic tendencies both in the contracting side of the industry and in the supply of materials. But it is surely gross exaggeration to say that 'these monopolies, whose costs of production are kept a strict secret, are completely outside any kind of public control or surveillance.' In fact, much of the evidence of monopolistic tendencies in these industries has derived from the very searching examination of their affairs by the Monopolies Commission. Moreover,

the passing of the Restrictive Trade Practices Act, 1956, has brought a wide range of price-fixing devices under the control of the Courts where it will be for the 'accused' to show that the practices complained of are not detrimental to the public. This seems a much more effective way of protecting the public than handing over the industry to a monopolistic corporation only vaguely responsible to Parliament.

Public opinion generally has accepted the nationalisation of certain industries—coal, rail transport, electricity and gas. It is quite clear, however, that public opinion is not yet convinced that nationalisation ought to be adopted as a general principle throughout industry. The public generally will require some very cogent reasons for being asked to vote for nationalisation of building and building materials. The case put forward by the NFBTO is hardly likely to convince the public. It is perhaps only fair to the Union leaders to add that the industry is capable of improvement in many directions, but this can be done without the dubious expedient of nationalisation.

Notes of the Week

A Foulston Church Threatened

AN item of bad news from the West Country is that Foulston's St. Catherine's Church at Plymouth is threatened with demolition to make way for the new Civic Centre. In the current number of the Architectural Journal of the Plymouth Branch of the Devon and Cornwall Society of Architects, Mr. C. H. P. Pearn, ARIBA, has a most interesting article in which he describes the church and suggests that some of its Soanic features may be due to Foulston's partner, George Whitwick, who had been a pupil of Soane. The article is accompanied by some vigorous pencil drawings. The author suggests that if the church cannot be retained on its present site it is worth removing to another, even if its use must change.

The Gildencroft, Norwich

THE City of Norwich, so rich in architectural treasures, was recently the location for a simple, but pleasing ceremony, when the Lord Mayor (Mr. Tom Eaton), accompanied by the Lady Mayoress (Miss Margaret Eaton), turned the key at No. 2, Gildencroft Cottages, thereby opening them for public inspection.

The significance of this act is that it is the first attempt to arrest the outward development of the city by providing homes at its centre. The Gildencroft is said to be the oldest row of small dwellings in existence in the country, and dates back probably to Tudor times. In Norwich, as elsewhere, critics of suburban development have deplored the neglected town centre, once peopled with busy communities.

Just over a year ago, by the odd vote in 49, Norwich City Council decided to restore the Gildencroft. Of the original 14 cottages, all in a tumbledown condition, two were demolished. The remaining 12 have now been converted to six dwelling houses, for which a long list of applicants was compiled long before the completion of the work. The ancient, massive timbers have been restored, some walls rebuilt and windows added. During the reconstruction windows with bars of timber, in use before glass was general, were discovered. The interiors have been sympathetically restored and modern amenities installed.

Adjacent to, and facing the beautiful church of Saint Augustine, the cottages are a pleasant oasis amid an interesting, if neglected, neighbourhood, with a wealth of interesting elevations, flint churches and open 'plains.'

The restoration, which has cost approximately £8,700, has enriched the city and provided an example, which, it is hoped, will be the forerunner of further development which will foster the community spirit, besides adding to the attractions of this lovely old city.

'Men at Work'

THE LATEST LONDON SITE on which the casual passer-by is invited to view the construction from an observation platform is that of the new American Embassy in Grosvenor-square, where Wates, Ltd., are engaged on the foundation contract. At present the main interest lies in the dexterity with which the bulldozer operators manage their machines, though other observers have been interested to note how close to the surface is the outcrop of sand and gravel. These observation platforms can be good advertisement for building and, incidentally, for builders.

CORRESPONDENCE

Incentives in the Building Industry

To the Editor of *The Builder*

SIR,—The recent Building Research Board paper reported in your journal [*The Builder*, August 16 and 23] gives me the general impression that incentive schemes are not really successful, and this is underlined in Table 6 recording bonus payments made in cases where wage costs exceed targets. The money for such payments cannot be specifically provided for and one is forced to the conclusion that there must be some loosely calculated contingency factor in the contractor's tender and/or, alternatively, he is losing money; either condition can have repercussions detrimental to the client.

Another disappointing feature is the virtual lack of liaison between the 'estimating' and 'bonusing' sections of contracting organisations, especially as it appears essential that the estimator's labour constants should be the basis for both the 'target unit' and 'unit rate' forms of bonusing.

The difficulties of applying incentives are many; considerable effort is necessary to calculate targets and—'it is generally accepted that losses on one operation cannot be offset by gains on another'—and where unit rates are applied—'regular measurement during the progress of the work constitutes a very onerous task,' i.e., expensive.

Another important factor is the achievement of a balance of payment to all the varied operatives whose work varies widely between and within trades. Taking examples from Table 4, the variation between trades, (using maximum figures), can be from 22 per cent. to 94 per cent., which demonstrates that a practical balance is impossible to achieve and this must be a fundamental cause of additional payments not related to targets, in order to avoid disgruntled labour and unrest.

A theoretical solution to these problems would be to arrange for the labour content

The Gildencroft, Norwich, as repaired. The architect was Mr. M. E. Gooch, ARIBA, assisted by Mr. J. R. N. Chapman, Student, RIBA. The cottages are being let at an inclusive rent of £2 5s. a week. (*See note*)

of every tender/final contract figure to exceed the actual prime cost of labour and to share the difference (or an agreed proportion) between the operatives on a pro-rata basis. Obvious practical difficulties are immediately apparent but the method would provide such a perfect answer that it seems worth while to try to overcome them.

The first difficulty is to assess the amount of labour cost included in the tender but this would be easy to solve by taking recognised labour co-efficients for each trade, or more accurately, to price out bills of quantities with the labour constants used by the estimator.

The second problem is due to the fact that the amount available for bonus will not be known until completion of the final account and it is desirable that a close figure should be available before the work commences. An assessment of labour costs could be made on the basis of similar work previously executed, or preferably the contractor's planning department should make a detailed assessment of the labour needed. In either case, it is important that there should be a favourable balance between the labour money content in the tender and the planned estimate of labour required to complete the work and this balance could be equated to the planned number of man hours proposed to show a theoretical rate of bonus per hour that the job should afford.

The third problem is that workmen would be unwilling to wait for the completion of the final account before collecting their bonus and it is suggested that this difficulty might be overcome by paying some agreed proportion of the theoretical rate previously calculated, as from the commencement of the work, with a finalising lump sum payment upon conclusion of the final account.

It is mentioned in the BRB paper that the success of any scheme is largely dependent on full comprehension by labour and my proposals would obviously require adequate explanation; I have, in my experience, discovered that many of the larger contracting firms have a solid core of men in their employ of long standing and extreme loyalty who would not have any qualms in trusting their employers to operate such a scheme in fairness and honesty, and it is suggested that a trial run could be given to such a scheme on a small to medium-size project predominantly staffed with such men. A graph could be displayed on site showing the total assessment of the target figure in trade order, together with a periodic indication of progress saving over the target. If the scheme could be successfully launched in this way and a reputation be earned for prompt and large final payments it would be possible to apply the system on a wider basis and obviate the unsatisfactory methods whereby bonus payments are not related to output.

In conclusion, I would suggest that 100 per cent. payments to labour are not in anybody's interest; the contractor (and management) should also have a direct financial interest and in this way, thought and effort will be applied at all levels to ensure that the men earn as much bonus as possible and, ideally, administrative and site bottlenecks should disappear.

R. A. W. HOARE [ARICS].

95, Lubbock-road, Chislehurst, Kent.

Coventry Churches

To the Editor of *The Builder*

SIR,—Reading the correspondence concerning Professor Spence's Coventry churches, and deploring the undercurrent of acrimony between 'Chartered Quantity Surveyor' and a distinguished architect, I do feel that Mr. Spence has allowed his non-conformist Scottish heart to rule his usually level head in stating that 'no surveyor was used in the negotiations.'

I am certain that a well-qualified quantity surveyor was used; the contractors must have many such on their staff. Mr. Spence may not have met him, but he no doubt did his part in attaining the target cost, and Mr. Spence's confidence in accepting without question the contractor's figures is perhaps as much a tribute to Messrs. Wimpey's surveyors as to anything else.

W. G. ROBATHAN [ARICS, AIArb].

17, Greenhill-street,
Stratford-upon-Avon.

Modern Architecture

To the Editor of *The Builder*

SIR,—Modern architecture will need to be saved from defenders like 'Spero.' He says it has no use for 'composition, proportion, symmetry, solid and void, light and shade,' etc., etc. ! No wonder that he ends by admitting that most contemporary building, compared to the work of the past, is like a transport café to the Ritz. Was not this the very complaint of your correspondent, W. J. Wills?

DONALD MCMORRAN [ARA, FRIBA].

14, North Audley-street,
Grosvenor-square, W1.

The Gravel Problem

To the Editor of *The Builder*

SIR,—Since my last letter to you on this subject was published in your issue of July 26 last, I have become aware that it contained several mis-statements which may have given an erroneous impression of the work of Twickenham Gravel Company, Ltd., at Yateley.

In regard to Chandlers Farm, I now realise that the company cannot in any way be held to blame for having demolished the house. When the company bought the property in 1955 the condition of the house was such that the Public Health Authority required them to give an undertaking that it would not be used for human habitation, and the Inspector agreed with the opinion of the company's surveyors that it could not be made fit for that purpose without totally uneconomic expenditure being incurred. Furthermore, the house was not a scheduled building under Section 30 of the Town and Country Planning Act, 1947, and the company had no reason to think that it was considered a building of architectural interest. In these circumstances I now appreciate that the company had no practicable alternative but to demolish the house as they did.

I have not personally visited the company's old workings at Yateley, but I understand that great care has been taken to 'naturalise' the lakes left behind after the gravel has been excavated, and that this policy has been followed ever since the workings were opened in 1940. I realise that a year or two must elapse before a new excavation can be 'healed' by sowing grass, and by planting trees and shrubs to replace those which must inevitably be cut down, and that the rawness of the early stages cannot be avoided. The depth of water in the new workings must often be lowered by pumping to enable the gravel to be won, and the final depth of the water will only be apparent after the operations are completed and the natural level is established. In speaking of 'swamps only a foot or two deep,' I was referring to the new workings near Fry's Lane, which have not yet had time to assume their final depth or appearance.

Regarding the fence along Fry's Lane, it has been pointed out to me that the company has always considered it essential to make its boundary fences as impenetrable and unclimbable as possible to avert the danger of children finding their way in, and that this consideration is of far greater importance than any aesthetic one. In this case I agree that the use of black steel posts instead of concrete ones has rendered the fence less conspicuous than it would otherwise have been, and that care was taken to preserve as many as possible of the timber trees in the original hedge.

I wish to apologise to the company for any impression I may have given that their activities compare unfavourably with those of other gravel companies. On the contrary, I am persuaded that this company takes exceptional care to mitigate the effect of their operations on the amenities of the neighbourhood, and to avoid offence to public opinion.

B. S. TOWNROE.

'Maresfield,' Yateley, Hants.

Lessons from the Jaguar Fire

To the Editor of *The Builder*

SIR,—In your editorial last week you summarise by observing that the nation cannot afford to go on having fires such as at the Jaguar factory. To prevent them, you say, we need facts obtained by research.

If by this you mean that existing knowledge produced by past research should be used, there can be no disagreement, but if everyone waits while more and more 'research' is made and more facts, mostly obvious enough, are assembled, then all research becomes a nonsense and a hindrance to progress. Let the knowledge any competent architect or fire assessor has be put to use right away!

G. B. B. RICHEY.

The Grove Lodge, Seal,
Near Sevenoaks.

Dixy Tea

To the Editor of *The Builder*

SIR,—Mr. A. W. Kenyon's references bring to mind a custom which prevailed during the last century in the offices of a well-known firm of quantity surveyors. An elderly assistant in my first office could recall seeing the office boy of that firm proceeding along Queen Anne's Gate regularly at 11 o'clock each morning with a row of pint cans on a wooden rod, into which nails were driven to prevent them from displacement. He returned from the ancient hostelry on the corner of Old Queen-street (long since rebuilt) with the cans duly filled with beer. There is no record as to whether this traditional British refreshment improved the output of the staff or otherwise, but the quantity surveyor of today would be horrified at such indulgence. The afternoon cup of tea is today deemed more appropriate.

E. C. HARRIS [FRICS].

7-12, Tavistock-square, WC1.

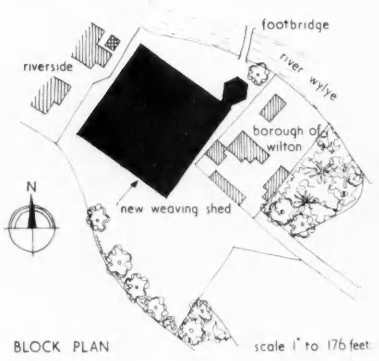
WEAVING SHED, WILTON, WILTSHIRE

for the Wilton Royal Carpet Company

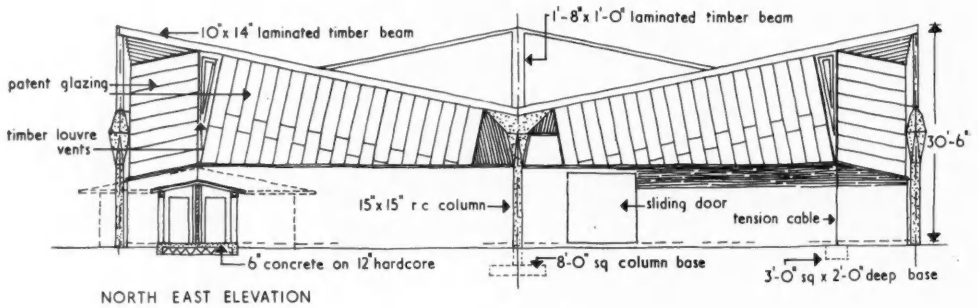
Architect :
ROBERT TOWNSEND, FRIBA

Structural Engineer:
H. TOTTENHAM, MA

Built by direct labour and the maintenance staff of the Wilton Royal Carpet Company



BLOCK PLAN scale 1" to 176 feet



NORTH EAST ELEVATION

THIS building is claimed to have the first multiple hyperbolic paraboloid roof in the world to be built in timber.

The building recently completed is to be a new weaving and finishing shed for broad loom carpets. The free floor area is 110 ft. square, and the headroom varies from a minimum of 18 ft. to a maximum of 30 ft.

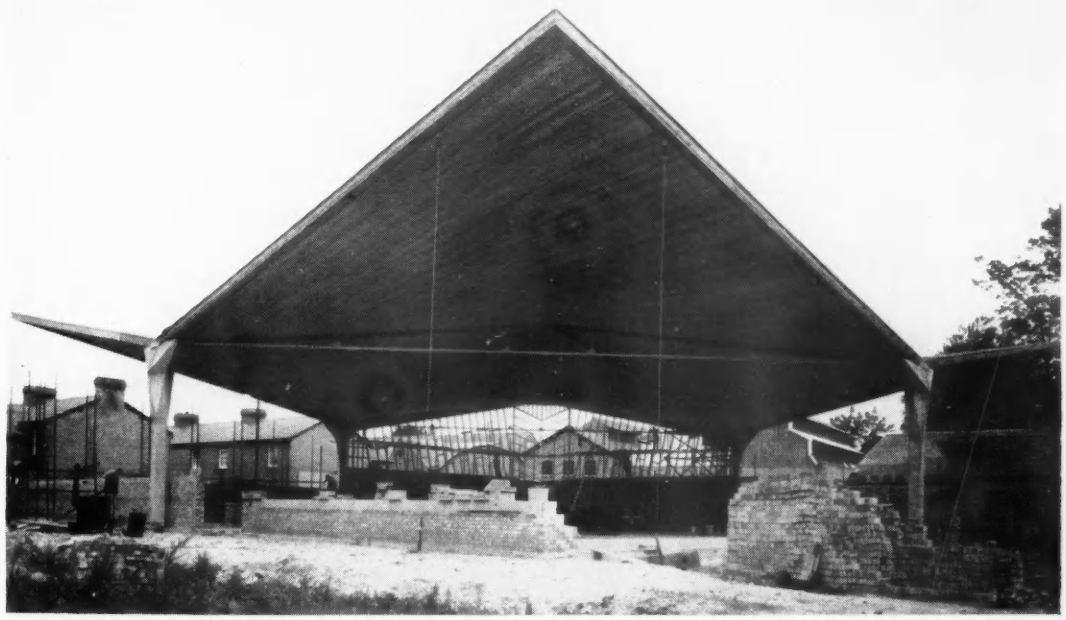
Without lighting and heating the estimated cost of the building per square foot of covered area will be under 28s., about half the normal cost of buildings with this floor area.

The wooden windows, the glazing bars of which are normal to the roof and not to the base wall, cost £1,000 including glazing, as against the only metal window quotation received of £3,055.

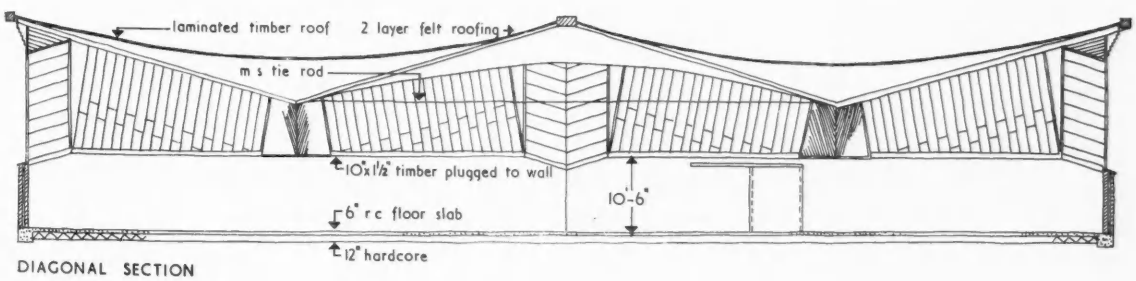
The total cost of the roof, including the scaffolding and everything above the column heads, namely the laminated edge beams, the shell itself, the tie rods and the 'Ruberoid,' works out at less than 10s. per sq. ft.

The design of the roof is something entirely new in timber construction and combines advanced engineering conceptions with simple carpentry. The roof itself is 114 ft. 10 in. square overall in plan and consists of four panels of hyperbolic paraboloid shells each 57 ft. 5 in. square. It is supported at only four points, on a concrete column at the mid point of each side, and is independent of the walls.

The 'shells' are $1\frac{7}{8}$ in. thick and consist of three layers of $\frac{5}{8}$ by 5 in., fifth quality tongued and grooved European redwood boarding, the top and bottom layers being straight and the middle layer forming a parabola running diagonally across. The lower and middle layers of boarding are bosticked together, and the top layer is nailed to them to within $\frac{1}{8}$ in. of the lower surface. A



From the south



DIAGONAL SECTION

6 ft. strip round the outer edge of each panel is glued with 'Aerolite 300' urea adhesive in addition to nailing.

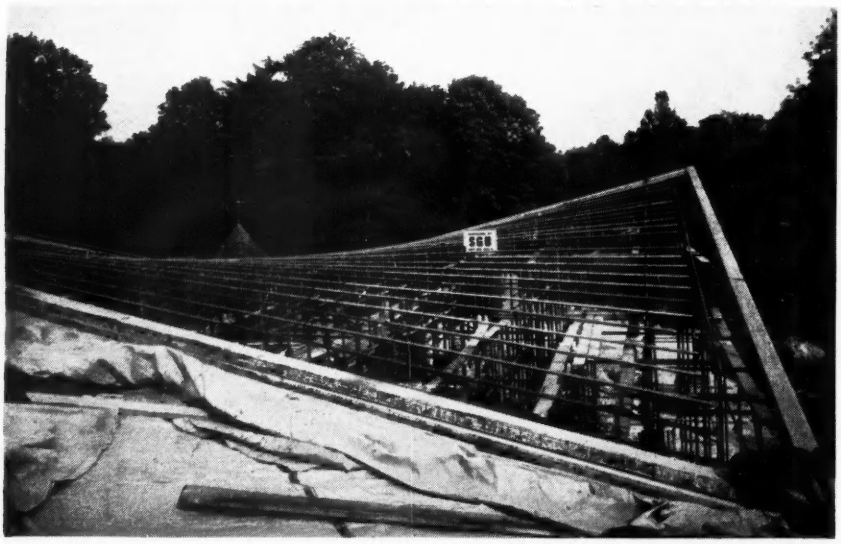
The underside of the roof is treated with two coats of a p.v.a. glaze sprayed on. The upper weather surface consists of two layers of 'Ruberoid,' the bottom layer being random nailed and the top layer mineral surfaced and stuck with a bituminous adhesive.

Edge beams of 12 laminae of 1 in. by 10 in. nominal unsorted redwood glued with 'Cascophen' resorcinol adhesive and 58 ft. 8½ in. long with a twist of 12 degs. to accommodate the line of the boarding, surround each 57 ft. 5 in. square roof panel. The beams are 12 in. deep with six laminae above the boarding and six below.

A 2¾ in. dia. mild steel tie rod runs diagonally across each panel from base of roof to base of roof and resists the outward thrust of the shell. The tie rods are somewhat heavier than necessary but were used as they happened to be available. Over 100,000 nails 1¾ in. long of 12 swg, were used to secure the roof boarding.

Before building started a quarter scale model of one of the roof panels was constructed in the Mechanical Testing Laboratory of the Timber Development Association near Beaconsfield and successfully withstood the calculated loading.

Top: Laying the second of three skins of T & G boarding
Bottom: The tubular scaffolding formwork and edge beams in position



Wilton Royal Carpet Co.'s Weaving Shed

Subcontractors & Suppliers:—

Reinforced concrete floor slab and columns, A. J. Dunning and Sons; timber, W. W. Howard Bros. and Co., Ltd.; glue for beams, Leicester, Lovell and Co., Ltd.; glue for shell, Aero Research, Ltd.; window frames, Chivers; roof covering, The Ruberoid Co., Ltd.; glass, Chas. Mitchell; copper down spouts, C.P.C. (Southampton); P.V.A. glaze and paints, Dixon's Paints, Ltd.; M/S tie rods, Priest and Mullings; end plates and hangers for tie rods, Brewers; electrical installation, The Southern Electricity Board; doors, The Salisbury Timber Co., Ltd.; scaffolding, S.G.B., Ltd.; tension cables, Lankester and Son, Ltd.

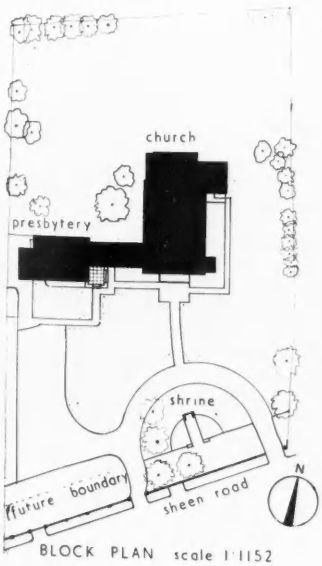
CHURCH AND PRESBYTERY

Our Lady Queen of Peace, Sheen Road, Richmond, Surrey

Architects: GOODHART-RENDEL, BROADBENT & CURTIS

Builders, Church: C. H. GIBSON, Ltd.

Presbytery: G. DUNKLEY



BLOCK PLAN scale 1:1152

THE FOUNDATION STONE of the new church, which was opened on May 9, 1954, was laid by Bishop Cowderoy on November 7, 1953.

The church as now built is considerably smaller than had been intended immediately after the war, but owing to the continual delay in obtaining the building licence and the subsequent rise in costs, considerable reductions had to be made. There is accommodation for 240 people with additional special pull-out seats for a further 60.

The church is built of normal solid brick wall construction with steel roof trusses and roofed with Collier's sand-faced hand-made pantiles.

Internally, the church is finished simply with an insulated board ceiling with lime-plastered walls left undecorated.

The reredos is of decorated fibrous plaster and wood and the altar of polished Hopton wood stone. The sanctuary fittings are of Austrian oak left slightly waxed. The floor is of Gurjun wood block.

The building is centrally heated with a radiator system with a thermostatically controlled oil-fired boiler.

The church was built behind two existing houses, one of which served as a temporary Chapel of Ease and Presbytery, and until possession of the other house was obtained it was not possible to demolish it and build the new presbytery. Demolition has, however,

Our Lady Queen of Peace, Richmond, Surrey

now been carried out and the new presbytery and parish room, also the garden work, have been completed. The new semi-circular road, car park and shrine facing onto the main road have also been provided.

The presbytery provides a sitting-room, dining-room, kitchen and housekeeper's room, large entrance hall, waiting room, lavatory and cloak-room on the ground floor, with four bedrooms, bathroom and w.c. on the first floor.

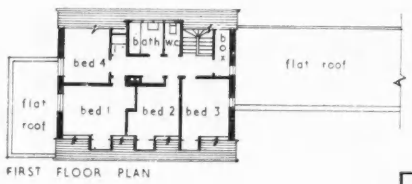
The figure in the shrine represents Our Lady Queen of Peace and has been carved by A. J. J. Ayres of Chelsea.

The five panels over the main window of the church, representing the five Joyful Mysteries, are the work of Miss Rosamund Fletcher of Oxford.

The cost of the presbytery, parish room and garage amounted to £6,225.

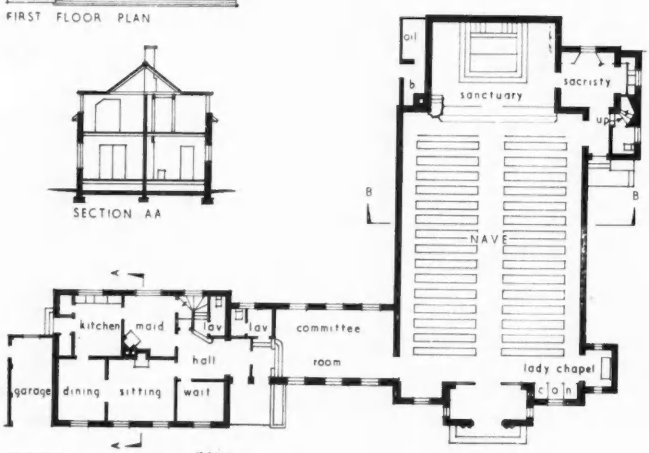
The final cost of the church, including all furnishings, amounted to approximately £15,775.

Reredos and altar



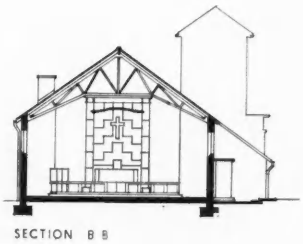
FIRST FLOOR PLAN

SECTION AA



GROUND FLOOR PLAN

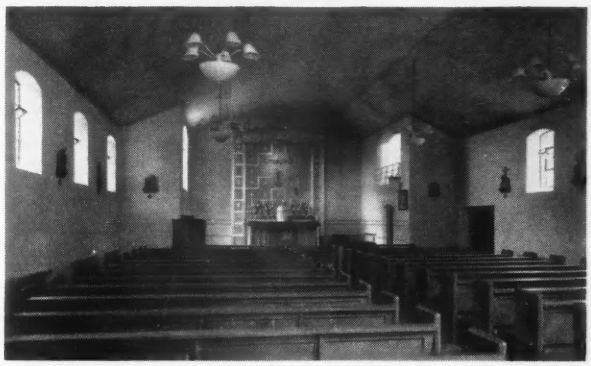
scale 10 5 0 10 20 30 40 50 feet



SECTION B B

PLANS & SECTIONS
Scale:
1 in. = 32 ft.

View from the sanctuary



The nave, from the entrance

Subcontractors & Suppliers:—

Facing bricks, Finnis, Ruault and Nicholls, Ltd.; stone font, J. Bysouth, Ltd.; collection boxes, Kingsmill Metal Co., Ltd.; false ceiling, Anderson Construction Co., Ltd.; Hopton Wood panels, Anselm Odling and Sons, Ltd.; terrazzo paving, Camden Tile and Mosaic Co., Ltd.; heating installation, Ellis (Kensington), Ltd.; roofing tiles, Finnis, Nicholls (Roofing), Ltd.; sanctuary railing, Kingsmill Metal Co., Ltd.; roof trusses, etc., James Lovell and Co., Ltd.; wood flooring, National Flooring Co., Ltd.; electrical service, South Eastern Electricity Board; windows, Wenham and Fowler, Ltd.; duct covers, Clark, Hunt and Co., Ltd.; sanitary fittings, John Bolding and Sons, Ltd.; decorated glass, London Sand Blast Decorative Glass Works, Ltd.; glass screen, Luxfer, Ltd.; gas service, North Thames Gas Board; door furniture, confessional shutters, Yannedis and Co., Ltd.; altars, etc., Fenning and Co.; altar decorations, G. Jackson and Sons, Ltd.; church furniture, C. H. Gibson, Ltd.

Our Lady Queen of Peace, Richmond, Surrey

The Five Joyful Mysteries

Drawn by Lawrence Wright

The Java-road low rent housing estate, North Point, Hong Kong. The new ferry piers and bus terminal are in the centre foreground. Eric Cumine, FRIBA, AADipl, architect

THREE NEW HONG KONG HOUSING PROJECTS

Government and Private Enterprise Schemes

By J. R. FIRTH, ARIBA, AIAA, MRSH

BUILDING in Hong Kong has been considerable in the post-war years, with the influx of population and resources from China when the present Government there took over, and building for residential purposes has not lagged behind. The boom in building has indeed surprised the world, and it shows no signs of falling off.

Three schemes of note, two for low-rental purposes, sponsored by the Government Housing Authority and the other a private enterprise project for the upper income group, are of greater magnitude than the usual run of such works. All are on the already over-crowded Hong Kong Island.

The farthest advanced of these schemes, the Java-road low rent housing estate, at North Point, has been designed by Eric Cumine, ARIBA, AADip. It covers 6½ acres on a fine site overlooking the harbour, and will accommodate about 15,000 persons, in nearly 2,000 flats. In addition to living quarters, there will be a primary school with 18 classrooms for over 800 children, a school clinic, outpatients' clinic, post office, a total of 73 shops, a new ferry terminal and concourse, bus terminal, and a community hall to be run by the North Point Kai Fong (village council).

A variety of accommodation will be provided in the flats, each of which will be entirely self-contained, with from 5 to 10 persons in each. The blocks generally are about 100 ft. high, of 10 storeys, and access is by a central corridor. Each flat has cross ventilation, this being made possible by breaking the line at intervals, on either side. At the western end of the estate is a U-shaped perimeter block, with a tower block at the open end; the eastern end has a similar arrangement, but with three tower blocks; and the central portion in between is one long building. There will be 28 lifts, and on top of each tower block is planned a children's playground with covered shelters.

The cost of the scheme is estimated at $33m., and work on construction of the carcase of all blocks of flats is well enough advanced to anticipate occupation of some almost immediately. The quantity surveyors are Messrs. Langdon and Every (Far East) and the contractors Messrs. Cheong Lee. Although rents have not yet been fixed, they are expected to be in the region of $60 to $120 a month, depending on accommodation.

The second of the Government schemes is the Cadogan-street project, on a rectangular site of 3⅛ acres on the slopes of Mount Davis, where a total of 2,595 flats will accommodate 19,500 people. The architect is T. C. Feltham, ARIBA, and site formation has recently been put in hand as a preliminary contract. The gradients of the hill slopes are extremely steep, often at an angle of 45 deg., the highest point of the site being 285 ft. above the present street level. These conditions have led to a system of planning across the contours

The Causeway Bay $30m. private enterprise scheme. Perspectives (left) of the Hyde Park and Fair View Mansions and (right) the Causeway Bay and Towning Mansions. Steven S. L. Yue, architect.

to allow successive storeys to extend towards the rising ground, each floor having an entrance at its intersection with the hillside.

Construction of both the Java-road scheme and the Cadogan-street project is of reinforced concrete frame with brick panel filling; concrete stairs and floor slabs, and flat concrete roofs, all designed to withstand typhoon wind conditions. Windows are metal; and the use of timber is kept to a minimum.

The first part of the Cadogan-street scheme, at the west end of the site, will have five multi-storey blocks giving 640 flats acommodating 4,500 persons at an estimated cost of $7,500,000. It is hoped to go out to tender for this section in June next, on a 12-month contract, and rents will be about $65 to $90 a month.

Also in the Cadogan-street project will be, in addition to flats, a three-storey community centre, playgrounds, 10 go-downs, and a number of shops.

At Causeway Bay, on a site having many associations with the history of the Colony—at Jardines Point, where the noon-day gun, made famous by Noel Coward's 'Mad Dogs and Englishmen,' has been fired for some 75-80 years—the go-downs are being demolished to make way for a private enterprise $30m. building project.

The scheme will include 12 four-storey blocks of flats which will rent at around $1,200 to $2,000 a month, or will be sold outright as individual apartments; together with a $10m. hotel with full restaurant and night club facilities. Each flat will have a floor area of about 1,500 sq. ft.

The site for the first two blocks of flats, to be known as Causeway Bay Mansions and Towning Mansions, is now being cleared and piling is under way. Construction will be started soon at an estimated cost of about $5m. each, as a contract for these two buildings has just been let to the Lam Construction Co. The blocks will have a total of 150 flats, and two similar blocks, the Hyde Park Mansions and Fairview Mansions, will follow at an estimated cost of $7m. each. All will be finished with teak floors on concrete slabs, mosaic tiles in bathrooms and on verandahs, and eight lifts will be provided. As a temporary measure, instead of the site standing idle, so far as earning capacity is concerned, a night club and open-air restaurant is to be constructed. It will have a short life, being pulled down as the scheme develops, to make way for a hotel on the waterfront overlooking the Royal Hong Kong Yacht Club, with its own pier, launch station and sailing facilities.

The site is being developed with flower beds, trees, and other landscape features for the owners of these $40,000 to $50,000 flats. Developers of this site are Kum Hing Land Investment Co., of Hong Kong, and the architect, Mr. Steven S. L. Yue.

A 'selling point' for these flats is that the 'fung shui' is good—'fung shui' being the Chinese science of selecting a lucky site from signs of favour in wind and water, more usually applied to necromancy.

The Story of Post-war School Building

A RECORD ACHIEVEMENT

'A SCHOOL is one of the few things that costs less today than ten years ago.' This statement is made by the Ministry of Education in a pamphlet published on August 29 by HMSO, 'The Story of Post-war School Building,' MoE Pamphlet No. 33, price 3s. 6d. It tells the story of post-war building and describes how, in spite of higher wages and rising prices, it has been possible to reduce the cost of new schools.

In a foreword, SIR DAVID ECCLES, when Minister of Education, said: 'The pamphlet is an account of the way in which some £360m. has been spent. The taxpayer has a right to know what he has got for this great sum. The broad answer is that he has had value for his money. I want the financial facts widely known. The post-war schools, like medieval churches, dominate the local landscape. By their purpose and design they testify to the spirit of our age. They will show how far we have applied our imagination and resources to the future of our children.'

Race Against Time

Between 1949 and 1961 at least 2,000,000 new school places must be completed and brought into use. By the end of 1956 over 1,772,000 new places had been provided. Owing to the increased birth-rate from 1942-1948, an enlarged school population is moving like a wave through the schools. To provide for these children in addition to making good the schools damaged during the war—about one school in every five was damaged—has been a race against time. But a record amount of school building has been carried out and we are up to schedule.

After 1961, when the number of children in schools will be at its highest, new schools will still be necessary as the development of new towns continues, but it will then be the Ministry's policy to replace each year some of the old schools.

Since 1939 building costs have been rising each year, and in the period 1949-56 they rose by over 50 per cent. By careful planning and by introducing economies without reducing standards it has been possible, in spite of these rises, to reduce the actual cost of new schools by 20 per cent. Had the 1949 prices remained stable the cost of new schools in 1956 would have been almost halved.

Costs have been held down in five ways:

(i) By greater knowledge and control of the constituent items of cost.

(ii) By a substantial reduction in the cubic content of each school building. For example, Victorian and Edwardian classroom ceilings were usually 14 ft. high. In 1949 they were still 11-12 ft. high. Today, the average is less than 10 ft. and in some cases as little as 8 ft. 6 in.

(iii) By harnessing scientific and industrial to architectural skills in search of better and more economical methods of building.

(iv) Money has been saved on such items as washhand basins, sanitary fittings, tables, chairs, and lockers which have been designed for children instead of for adults.

(v) By not indulging in costly architectural styles and devices.

Dealing with the relationship between the central and the local government the pamphlet explains that the Ministry's role has been primarily to establish the right conditions for the effective control and execution of large-scale building programmes. A thousand building projects a year cannot be run from the Ministry. It is the responsibility of the local authorities to design, erect and operate these buildings. The Ministry sets a limit of cost per place for new schools, but the freedom of local authorities to work within these requirements is substantial.

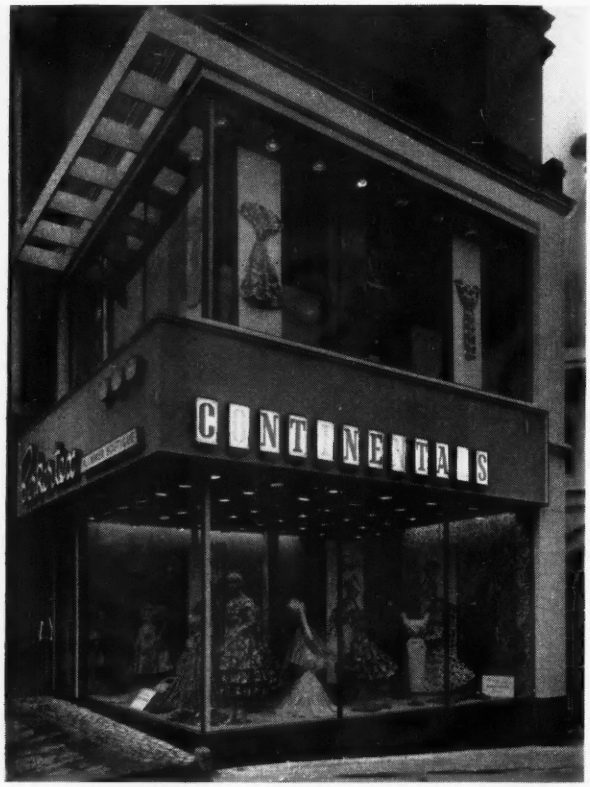
To assist authorities the Ministry disseminates up-to-date information, mainly through its Building Bulletins, of which about 120,000 have been sold. Many of these bulletins have been sold abroad where the reputation of British post-war schools stands very high.

A Changing Pattern

The general pattern of schools has changed through the years. They are no longer mere machines for giving lessons but are social units concerned with the all-round development of boys and girls. There should be different kinds of schools to provide for variety in the ages, aptitudes and abilities of the children. They must be designed to offer a wider range of subjects than in the past. New kinds of teaching methods call for new kinds of teaching materials and equipment. More than half the children take a mid-day meal at school, and new schools must be designed to cater for this provision. Schools must be well designed and constructed and not make unreasonable demands for maintenance.

Sir David Eccles says: 'Between jerry building and magnificence there is ample scope to secure that the building fulfils its function and also pleases the eye. I believe that we have achieved that compromise between elegance, efficiency and economy which should mark all great building programmes.'

SHOP, BRIGHTON

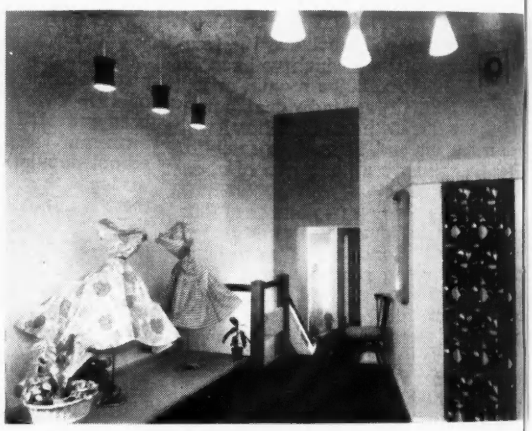


Western-terrace elevation

THIS corner shop is at the junction between Western-road and Western-terrace, Brighton, and is part of Plummer Roddis's main store at the other side of the terrace. The main handicap of the existing shop proved to be the rather narrow link between the front premises and the rear. At the back of the shop stands a Regency house, built in pure 'Brighton Pavilion' style, complete with onion-shaped dome. It contains some delightfully proportioned oval rooms with lofty ceilings.

The clients called for the following requirements: A 'face lift' to the existing two-storey shop front, on Western-road and Western-terrace, widening of the opening between the front and the rear shop on both floors and new link in the basement, and the provision of fitting cubicles in each room and hanging rails for the display of garments.

The work carried out provided, as far as external work is concerned, the renewal of the shopfront



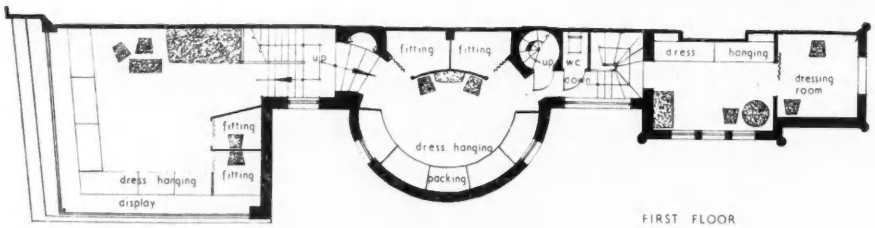
First-floor display area with fitting room on the right

Architects:

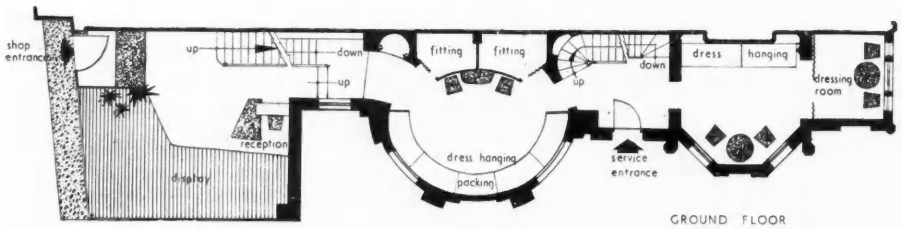
MARMOREK & WEAVER

Builders:

FIELD & COX, Ltd.



FIRST FLOOR



GROUND FLOOR

PLANS & SECTION
Scale: 1in. = 16 ft.

for Plummer Roddis, Ltd.

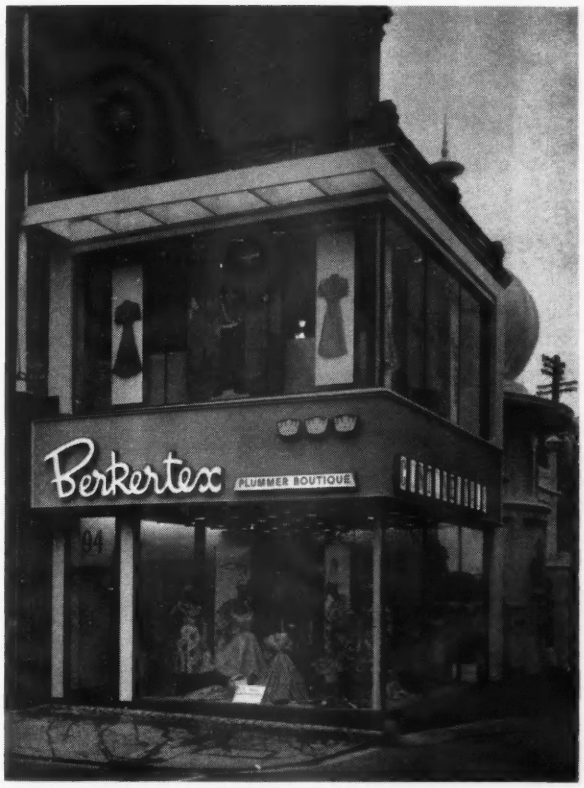
itself, with a new fascia and neon lighting.

Internal structural alterations included the widening of the opening between front and rear and the removal of some stud partitions in the oval rooms to gain some space to accommodate fitting cubicles. A new illuminated ceiling was provided over the front part of the shop itself. Adjustable screens in the shop window replace the traditional solid back screen and help to visually link the front with the back.

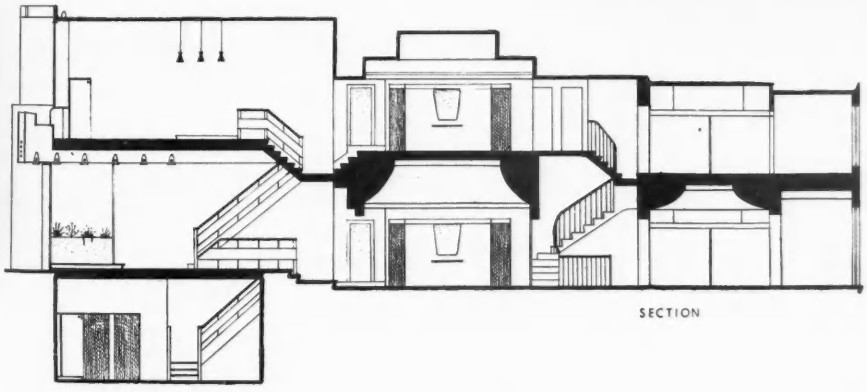
The colour scheme to the front of the shop includes a dark blue ceiling with one papered wall in white and black illuminated by a fluorescent lighting trough; the other wall is in yellow with the far end wall in rust. The carpets are grey throughout the ground floor. The rear rooms are a combination of white, yellow and grey. The upstair rooms are carpeted in red and the walls treated similarly to those on the ground floor, with curtains in grey and yellow.

Subcontractors & Suppliers:—

Shop front, Drake and Son, Ltd.; internal shopfitting, Binder and Harmer; lighting fittings, Courtney Pope (Elec.), Ltd., Troughton and Young; electrical installation, Galliers; furniture, curtains and carpeting, Plummer Roddis, Ltd.; display fitments, London Display, Ltd.; electric fires, Falkes.

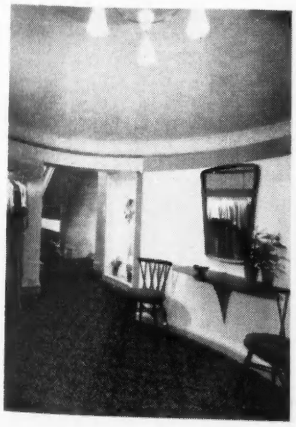


Western-road elevation



SECTION

1. **2.** **3.**



1. *First-floor oval room*

2. *From the main entrance with main staircase up to first floor*

3. *The head of the main staircase*

COUNTY HALL, CHESTER

E. MAINWARING PARKES, FRIBA, County Architect

Consultants, Structural:
WILLIAM JONES, MIStructE

Electrical:
E. G. PHILLIPS, Son & NORFOLK

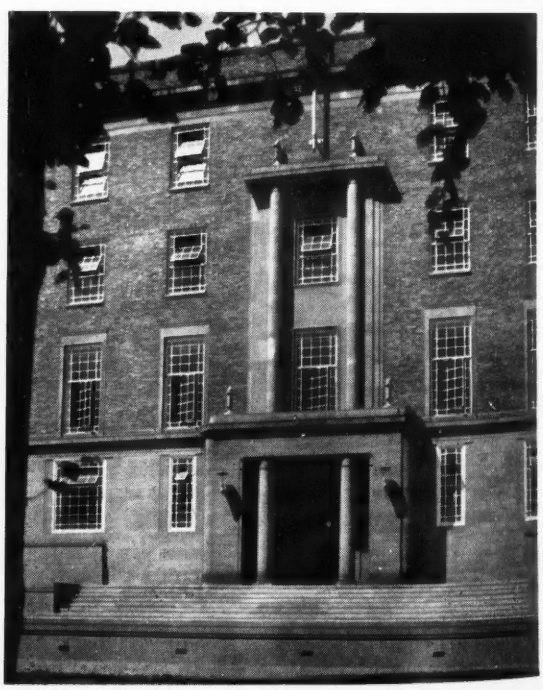
Quantity Surveyors:
HURRELL & TAYLOR

Builders:
J. GERRARD & Sons, Ltd.

On 11th July Her Majesty the Queen officially opened the new Cheshire County Hall. The building of this hall began in 1938 with the object of bringing all departments of the Council under one roof.

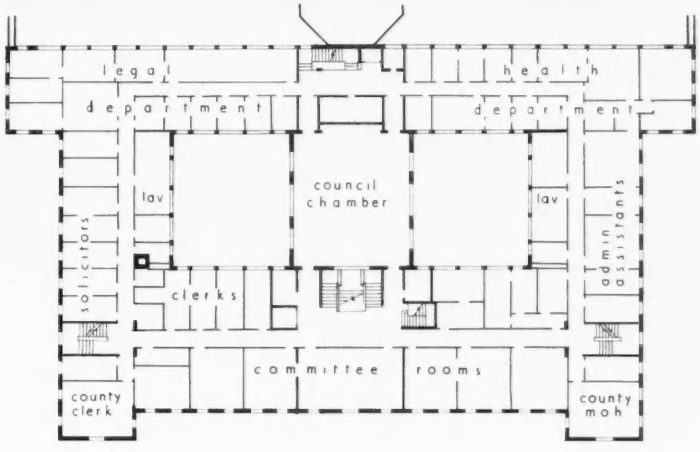
Originally the building was designed as a reinforced concrete frame structure, but when the project was resumed in 1954 the system was changed to a steel frame from the level of the first floor and the internal planning and elevational treatment completely re-designed to suit new requirements.

Externally the building is faced to first-floor level with natural stone, with 2-in. brickwork over. Internal partitions are brickwork and steel partly glazed partitioning. The floor finish generally is Granwood blocks with rubber flooring to the corridors. An invisible panel warming system is installed,

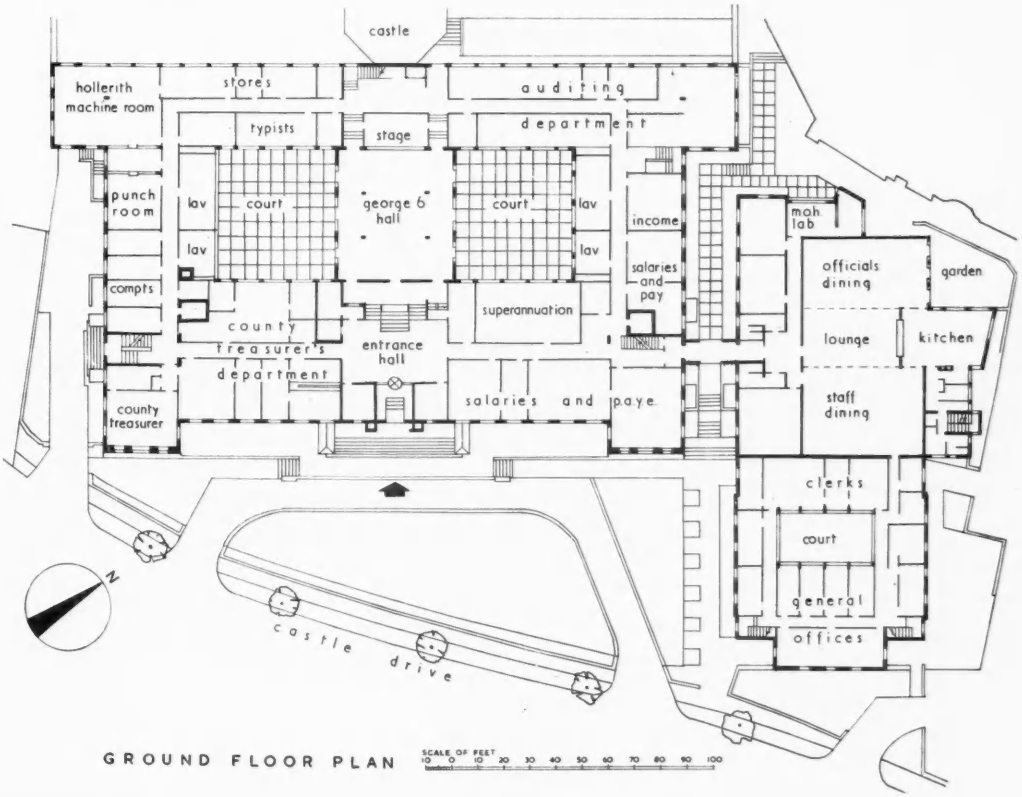


Main entrance

First-floor landing



FIRST-FLOOR PLAN
Scale: 1 in. = 64 ft.



GROUND FLOOR PLAN SCALE OF FEET 10 0 10 20 30 40 50 60 70 80 90 100

County Hall, Chester

Council chamber

and the boilers are oil-fired.

The approximate total cost of the scheme will be £667,000 which includes the pre-war expenditure of £65,000 and £12,000 spent on temporary work since the war.

The cost may be summarised as follows:—

	£	£
Main Hall—		
Building contract	398,868	
Telephones	13,385	
Furnishings	24,567	
New office furniture	36,930	
Equipment	1,010	
Miscellaneous items	2,613	
		477,373
Annexe—		
Building contract	91,852	
Dining-room furniture, kitchen equipment, etc.	7,588	
		99,440
Estimated cost of providing garage accommodation, offices for area children's offices, etc.		13,500
		£590,313

Entrance hall

Subcontractors & Suppliers:—

Painting, James Stott and Son, Ltd.; plastering, W. J. Roberts and Son, Ltd.; floor tiling, John Stubbs (Marble and Quarzite), Ltd.; thermoplastic tiling, Semtex, Ltd.; cork insulation, Cork Insulation and Asbestos Co., Ltd.; granolithic paving, Stuarts Granolithic Co., Ltd.; tarmacadam, Bituminous Surfacing, Ltd.; asphalting, Davies Bros. (Asphalters), Ltd.

Stonework, H. A. Clegg and Sons, F. M. and N. Nuttall, Ltd.; precast concrete floors and roofs, Concrete, Ltd.; electrical installation, Hallams, Ltd.; panel warming, ventilation and domestic water services, Richard Crittall and Co., Ltd.; heating and hot water services installations (annexe only), C. Seward and Co., Ltd.; patent roof glazing, W. G. Kaleyards, Ltd., Hills (West Bromwich), Ltd.; passenger lifts, Wm. Wadsworth and Sons, Ltd.

Steel partitioning, Chatwood Milner, Ltd.; joinery work (Council Chamber), J. P. White and Sons, Ltd.; stone carving, H. Tyson Smith; Granwood flooring, Granwood Co., Ltd.; metal balustrading and handrails, The Birmingham Guild, Ltd.; rubber flooring, Semtex, Ltd.; fibrous plaster decoration, H. E. Gaze, Ltd.; lightning conductors, W. J. Furse and Co., Ltd.; faience wall slabs, The Leeds Fireclay Co., Ltd.; guard rail panels, Cecil Welding Co., Ltd.; marble wall linings, J. and H. Patteson, Ltd.; vitrolite wall linings, Charles Lightfoot, Ltd.

Revolving doors, Sheperdsons; acoustic tiles, W. F. Hollway and Bro., Ltd.; electricity supply, M.A.N.W.E.B.; gas supply, North Western Gas Board; plastic diffuser ceiling panels, Lumenated Ceilings, Ltd.; metal windows, W. G. Kaleyards, Ltd.; sanitary fittings, Rogers and Jackson; vitro-slab panels, Plyglass, Ltd.; Plymax W.C. compartments, Venesta Ltd.

Ironmongery, James Gibbons, Ltd.; ventilation grilles, G. A. Harvey and Co., Ltd.; hat and coat stands, Parker, Winder and Achurch, Ltd.; platform hoist, Herbert Morris, Ltd.; collapsible gates, Bolton Gate Co., Ltd.; facing bricks, Williamson and Cliff; common bricks, Castle Brick Co., Ltd., Hooton Brickworks, Ltd.; white glazed bricks and internal faience cills, Leeds Fireclay Co., Ltd.; paint, Walpamur Co., Ltd., I.C.I., Ltd.; artificial stone and precast concrete paving slabs, Premier Artificial Stone Co.

Structural steelworks, Whitnall and Gregory, Ltd.; internal telephone installation, Telephone Rentals, Ltd.; lighting fittings, General Electric Co. Ltd., Falk Stadelmann and Co., Ltd.; G.P.O. telephone installation, Telephone Manager; curtains, Waring and Gillow, Ltd.; carpets, Browns of Chester, Ltd.; watchman's tell-tale system, Gent and Co., Ltd.; master clock system, English Clock Systems, Ltd.; decorative glass panels, Pilkington Bros., Ltd.

Furniture, Wolff and O'Meara, Ltd., J. P. White and Sons, Ltd.; perspex name panels, Laidlaw and Thomson, Drakard and Humble, Ltd.; steel shelving, Sankey Sheldon, Ltd.; kitchen equipment, Radiation Group Sales, Ltd.

New

Housing

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News of the Week

Housing Conference, Brighton

MORE than a thousand delegates, including many chairmen of housing committees and officers from local authorities, are expected to attend the twenty-sixth annual conference of the Institute of Housing, to be held this year at The Dome, Brighton, on September 12 and 13.

At the opening session, on the morning of September 12, there will be an address by Mr. J. R. Bevins, MP, Parliamentary Secretary to the Ministry of Housing and Local Government. This will be followed in the afternoon by a paper on 'The Effects of Rent Restrictions and Decontrol' by Mr. A. Norman Schofield, Town Clerk of Southampton.

On September 13, the subject for discussion at the morning session will be 'Slum Clearance—A Review of Progress' by Dr. Donald Bradbury, FRIBA, City Architect and Director of Housing, Liverpool; in the afternoon a paper will be presented by Mr. R. J. Allerton, FRICS, Director of Housing, London County Council, entitled 'Flats — Management, Aspects of Design, Equipment and Layout.'

Some 350 delegates will tour the Brighton and Hove Corporations' housing estates on Saturday morning, September 14.

Exchange of Visits

THE Town and Country Planning Association and the Soviet Relations Committee of the British Council have arranged an important exchange of visits by parties of leading town planners. They will study specially the policy and progress of slum clearance and city reconstruction, limitation of the size of cities, dispersal of industry and people to new towns, neighbourhood planning, green belts, and planning research.

The Soviet party will be in Great Britain from September 10 to 29. After visits to the Ministry of Housing and to the Town and Country Planning Association office, it will study the plans of the London County Council and Greater London, and visit the new towns of Welwyn, Hemel Hempstead and Crawley. Among other places visited will be Birmingham, Coventry, Stafford, Manchester, Liverpool, Edinburgh and Glasgow, and the new towns of Glenrothes and East Kilbride.

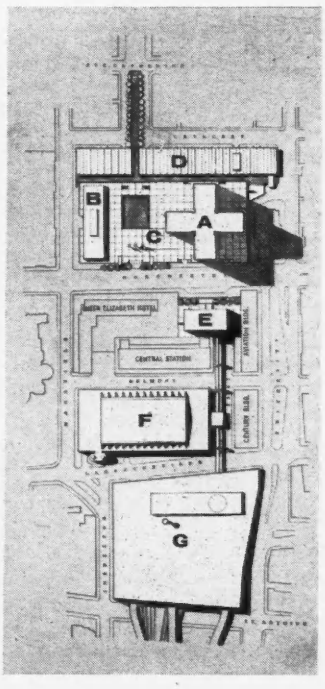
The British party, which will be led by Sir Frederic Osborn, chairman of the T and CPA, will visit the Soviet Union in April or May next.

Snowdonia Consultant

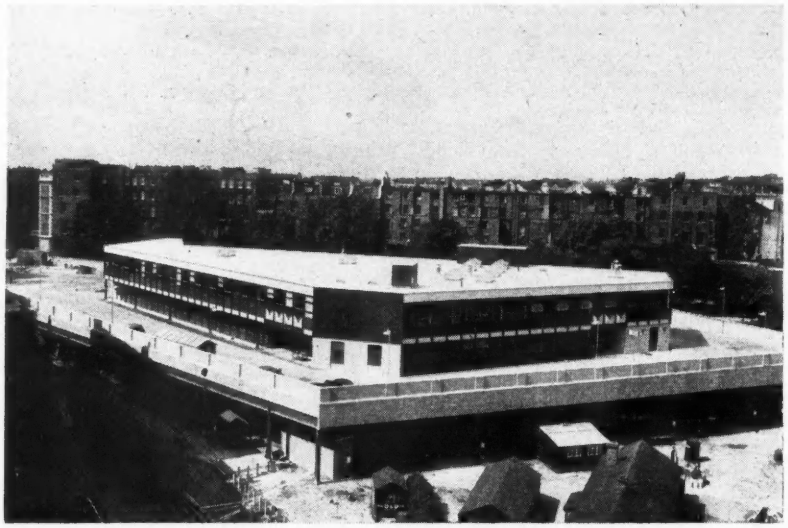
PROFESSOR J. S. ALLEN has been appointed by the Snowdonia Park Joint Advisory Committee at Dolgelly as their consultant in succession to the late Sir Patrick Abercrombie. Professor Allen is the head of the Town and Country Planning Department of King's College, Durham University.

International Ghent Fair

THE UK representative, Mr. R. C. Liebman, of the 12th International Ghent Fair, writes: 'Both the Board of Trade and the Council of Industrial Design turned down official invitations to be represented at the Fair, which opens on September 7. The Board of Trade would not even accept the offer of a completely free stand. The Council of Industrial Design likewise decided against availing itself of this wonderful and unique opportunity to show the Continent at least a



CENTRAL STATION AREA DEVELOPMENT, MONTREAL.—Large-scale development of downtown Montreal is proposed as seen in this model of the master plan which has been designed for the development of Canadian National Railways' terminal area of 21 acres around Central Station. Looking north, the model shows the 40-storey cruciform-plan office building which will be sited in Place Ville-Marie to the north of Dorchester-street. Other additions contemplated in the master plan for later construction include the transportation centre in foreground (with helicopter landing area on roof) which would occupy the whole of the block bounded by Inspector-, St. Antoine-, Lagauchetiere- and University-streets. The large convex-roofed building in the centre would house the CNR headquarters general offices, and between this and the 40-storey building is shown the proposed 20-storey office block, which would front on Dorchester-street between CNR's Queen Elizabeth Hotel, now nearing completion, and the International Aviation Building. The developers are Webb and Knapp (Canada), Ltd., and the town planner is V. de Pasciuto-Ponte, the architects being I. M. Pei and Associates, working in conjunction with CNR architects. Henry N. Cobb and Pershing Wong are architects in charge. The project will cost about £75,000,000



WEST LONDON AIR TERMINAL.—The new air terminal for British European Airways is nearing completion on the Cromwell-rd. site. It is a temporary building, built by Richard Costain, Ltd., and designed by their architect's department. A perspective sketch of this building, as a project, was published in THE BUILDER *on March 22 of this year*

selection of good modern British design at the first-ever "European Homes Exhibition—Modern Home" which will be the special feature of this year's fair. Despite this inexplicable lack of enterprise on the part of people who always talk about the European Common Market, but funk taking practical action, the participation from individual British firms has been surprisingly high,' states Mr. Liebman. 'Many London, Midlands and Scottish manufacturers will be showing electrical and gas equipment, oil burning heaters, furnishing, office equipment, and engineering and building equipment.'

Building Centre for Bristol

A PERMANENT Building Centre to be known as 'The Bristol Building Centre' is to be opened in October. About 200 local, national and foreign firms will be connected with the Centre which will be administered by a council of architects and prominent building personalities in the building industry and will be non-profit making.

An information counter will provide technical details on all building matters and there will be a comprehensive supply of manufacturers' literature, technical publications and standards. There will be a demonstration room where special exhibitions will be held and a lounge where building owners, architects and builders can meet.

'New Town' Near Luton

A SCHEME for a 'new town' for a 7,000 overspill from London, to be built at Houghton Regis, outside Luton, was approved on August 28 by the Ministry of Housing and Local Government. The people of the town will work in car factories in Luton and Dunstable. No industry will be brought from London.

Appointment Open

THE London Master Builders' Association has a vacancy for the appointment of an official at senior level to deal with contractual and legal matters and general administration. Knowledge of the industry an advantage but not essential. Details from the Secretary, LMBA, 47, Bedford-square, WC1.

Professional Announcements

MESSRS. ERUNTON, BADEN HELLARD & BOOBYER announce that as from September 1 their office at Brackenbury Farm, South Harefield, Middx., has been transferred to 50 Woodcock-hill, Kenton, Middx. Tel.: Wordsworth 3026.

MR. F. J. SAMUELY, consulting civil engineer, has taken into partnership MR. F. NEWBY, MR. W. F. SMITH, and MISS P. HUTCHINGS. The practice will now continue as MESSRS. FELIX J. SAMUELY AND PARTNERS.

MR. ROBERT G. W. FORDE, ARICS, chartered quantity surveyor, has set up in practice on his own account at 96, Mosley-street, Manchester, 2 (tel.: Central 0628).

COMING EVENTS

SATURDAY, SEPTEMBER 7.

INSTITUTE OF BRITISH PHOTOGRAPHERS.—Exhibition, 'Professional Photography, 1957.' Royal Society of British Artists, Suffolk-st., SW1. Mon.-Thurs. 10 a.m.-5 p.m., Fri. and Sat. 10 a.m.-7 p.m. Continuing until September 17.

TUESDAY, SEPTEMBER 10.

INSTITUTE OF QUANTITY SURVEYORS (South-East Branch).—'Contractors' Claims.' By G. E. Allcock, FIQS. Brighton Technical College. 7.30 p.m.

THURSDAY, SEPTEMBER 12.

INSTITUTE OF HOUSING.—Mr. J. R. Bevins, Parly. Sec., MoHLG, at opening of 26th Annual Conference. The Dome, Brighton. 10 a.m. (Continuing until September 14.)

SATURDAY, SEPTEMBER 14.

ECCLESIOLOGICAL SOCIETY.—Visit to St. Mary's Church, Twickenham, and All Hallows Church, Chertsey-rd., Twickenham. 3 p.m.

OBITUARY

B. W. L. Gallannaugh, FRIBA

BY THE DEATH (briefly reported last week) of Mr. Bertram William Leonard Gallannaugh, FRIBA, the architectural profession is deprived of the services of one of its foremost designers of modern newspaper offices. With Herbert O. Ellis and W. Lee Clarke, of which firm he was at the time of his death principal, he had been concerned with the design of the *Daily Express* offices (for which Sir E. Owen Williams was consulting engineer), the *Star* building (both in the Fleet-street area), buildings in Colombo for the *Ceylon Times*, in Plymouth for the *Western Morning News*, in Manchester for the *News of the World* and for Southern Newspapers in Southampton. He had currently been engaged on plans for the *Daily Gleaner* at Kingston, Jamaica.

Mr. Gallannaugh will best be remembered, however, by his plans for the layout of Grosvenor-square, which included the British people's memorial to the late F. D. Roosevelt, in the sculptural parts of which Sir William Reid Dick collaborated. This work has a dignity and simplicity of a high order.

Born in 1900, Bertram Gallannaugh studied at the Central School of Arts and Crafts and at the Royal Academy Schools. Later he joined Ellis and Clarke, becoming a partner in 1932. He died in Ireland on August 26.

FROM 'THE BUILDER' OF 1857

Saturday, September 5, 1857.

DIRECT RAILWAY COMMUNICATION BETWEEN ENGLAND AND INDIA.—Deplorable circumstances have occurred to render more apparent the necessity for connecting our possessions in the East more closely with the seat of Government at home. Mr. Sankey writes: 'Such a line would diminish the distance of India from our shores, and it would then be as easy to protect it as it is now for us to defend our West Indian and Canadian possessions. We need never fear it being invaded by sea; and, in the event of the railroad I propose being constructed, we could always get there at least as soon as our enemies, so that we should no longer have to fear either foreign aggression or internal commotion.

'Should the railroad be executed effecting a through land communication all the way from England to India, our commerce would increase to an extent unknown in the world's history, and nothing could then interfere with our East Indian dominions. If, however, the British Government does not establish that communication, other nations most assuredly will.—*From an Article.*

Research Centre, Lincoln

WE are asked to state that those responsible for the design of the Research Centre, Lincoln, for Ruston and Hornsby, Ltd., published in our issue of July 19, were Mr. J. C. Clavering, FRIBA, in association with Mr. A. L. Wells, BSc, AMIMechE, chief works engineer, Ruston and Hornsby, Ltd.

THE TOWN AND COUNTRY PLANNING SUMMER SCHOOL

Wide Range of Subjects Under Discussion

A wide range of subjects affecting all aspects of planning were discussed at the Town and Country Planning Summer School, held under the auspices of the Town Planning Institute, which opened at Oxford on Monday (September 2). The President of the Conference was Sir George Pepler, CB, P-PTPI. Extracts from three of the earlier papers read, respectively, on September 3, 4 and 5, are given below.

Modern Industrial Developments and Land Planning

By S. L. G. BEAUFOY, CBE, P-PTPI, FRIBA

THE whole theme of this paper raises questions about the adequacy of the provision made in development plans for industrial land and for housing, water supply, drainage, and other community services. It may well be asked whether these match up to the needs of a rapidly expanding and changing economy. The town maps, of course, are dealing with areas which are already the scene of most of the existing industry in our national life, or with areas on the periphery of our large towns where new development can be fairly clearly envisaged.

Here, it may interest you to know, the maps showed a planned increase in industrial land of 40,000 acres, i.e., from 90,000 to 130,000 by 1971. This was a reasonable, though perhaps somewhat modest, estimate when thinking of existing industry, and the needs for its expansion or its resettlement in more suitable localities. But it is not fanciful to imagine that an increase of this order may be entirely surpassed by new industrial developments of the kind which have little place in submitted development plans.

As regards the county plans and reports which were prepared in 1949-50, it is quite evident that apart from the conservation of areas of high natural beauty and of mineral resources planning authorities were mainly concerned with three local objectives. They expressed the need for more industrial activity on a small scale to provide greater diversity of employment and a more prosperous economy than agriculture offered by itself. They sought to stabilise, if not to increase, the existing level of population and to put an end to the continued loss by migration. And finally, they made provision to meet the requirements of the local people for new housing, schools and public utility supplies.

All these aims are right. They stem from an analysis of local conditions and local requirements. From this point of view the county plans are firm and valuable documents which will not require a great deal of amendment at the first review. But should the unexpected but necessary major industrial development come along, such as an atomic research

PINKWELL JUNIOR SCHOOL, HAYES, MIDDLESEX.—Architect, C. G. Stillman, FRIBA, County Architect; Chief Assistant, T. Rytarowski, Dip Eng Arch; Builder, J. Lawson & Co. Ltd. The two main staircases are on either side of the ground-floor cloaks area. The pleasant effect on the staircase wall was achieved by hanging the wallpaper horizontally

station, oil refinery, petro-chemicals plant, or integrated steel works, the original basis of the county plan may require considerable recasting. It is a striking reminder of the rapidity of such development that the sites now occupied by chemical works at Wilton, oil refineries at Fawley, and the steel works at Margam were open country barely a decade ago.

What can we do about this? We must first be aware of the nature of these changes in our modern economy, of the siting requirements of the new industries and of the demands they will make upon public utility supplies and the transport system. With these points well in mind we must try to recognise the potential value of our land and see to it that those areas which hold real promise for our industrial future are safeguarded for this purpose. We dare not neglect this responsibility for the conservation of inherently valuable sites.

Secondly, where such potential national advantages give rise to proposals for development, unforeseeable at the time the plan was prepared, we must be ready if need be to adjust the plan to the changed circumstances with the minimum of interference with existing and legitimate interests and the maximum advantage to the local as well as the national economy.

The conflict between the claims of development and the claims of safeguarding the rural environment is likely to intensify in the future, and it is not going to be easy of solution. It is sometimes suggested that we can no longer divide our land into the useful and the beautiful, but must regard it as one, in which the landscape is at once our workshop and our playground. For myself, whilst I agree that the buildings of modern industry can be, and often are, beautiful, I am at present doubtful whether such a complete unity of environment is yet practical of achievement.

Though there is no natural coincidence between industrial development and rural preservation, the planner, and more than ever, the landscape architect, can help to achieve a practical reconciliation of the two. We have seen the results of a lack of planning in the first industrial revolution; let us ensure that this second industrial revolution finds us ready.

Slum Clearance and Redevelopment from the Design and Economic Point of View

By A. G. SHEPPARD FIDLER, FRIBA, AMTPI

ALL our experience in Birmingham suggests that it is much easier to deal with large areas than with small. By so doing not only can the whole character of an area be changed and, therefore, be reborn to new life, but the psychological effect on all who work and live there be all the more profound. To be really effective, redevelopment must be complete. A few new streets and a few new houses in an otherwise depressing and decaying area will never succeed: the whole area must be new and be very different from what was originally there.

It is perhaps not always realised that redevelopment of an area nearly always means a considerable loss in the total of houses. The more redevelopment carried out, therefore, the greater the number of families who have to be found accommodation elsewhere, and these families are, of course, in competition with those on the authority's regular housing list.

How can this additional population be housed, as it will be many years before the city's population matches that determined by the development plan? In the first place, we can make better use of what land is still left by accepting occasional pockets of higher density in a predominantly low density area. This is being done in Birmingham on suitable sites. Another line of attack is to purchase blocks of large Victorian-era houses now decaying, which stand in substantial grounds, and redevelop the whole area.

The other means of rehousing population are the overspill arrangements made with receiving authorities under the Town Development Act and the New Towns themselves. One cannot help feeling that the contribution of the new towns to our population difficulties could have been much greater, without any loss that I can see, if their planners and architects had been allowed to build to higher densities than those now accepted.

Basis of Comparison

If a real basis of comparison could be established it would be interesting to see whether it is more economically sound to rehouse say 60,000 people in a new town, or to rehouse them by the other methods I have mentioned, within the city, combined with overspill arrangements with neighbouring authorities.

The next point to consider is density and the resultant character of housing redevelopment. I consider that density control should be administered in a less rigid manner than it is often done at present, so that greater variety may result and the nature of the ground and other factors taken more into account. Good regulations and fine administration cannot themselves achieve good design. We need interest, variety and inspiration in this vital urban rebuilding.

One of the reasons why tall blocks of small site-cover are not more used is that the open space which has to surround them is of no benefit to the general public. To take an extreme instance, Le Corbusier's Unité at Marseilles, with a density a little higher than that of Lansbury, is surrounded by what amounts to a good-size public park. In this country, such open space created by a similar layout would be regarded as for the tenants only and other public open spaces would have to be provided on the basis of so many acres per thousand population.

In this way, rigid regulations may well prevent a common-sense solution to a problem. If we could only revise our ideas on this point, what a fundamental effect it could have on gross densities in central areas and on cost of development!

In spite of all the research carried out and advice given, the cost of flats or maisonettes in blocks over four storeys in height is still considerably more than similar accommodation provided in two-storey houses. The gap is narrowing but it is still an important factor. However, I feel we should average costs over areas of development in considering this problem. The fact that some persons will live in tall blocks permits others to live in houses, and it seems only fair that cost should be related to a unit figure within a prescribed area.

Distances Between Houses

I just pose the question—is 70 ft. sacrosanct as a minimum distance between faces of houses in a street? Certainly it is not required for daylighting and many experts feel strongly that 60 ft., or even less, is perfectly adequate for privacy, especially if a zigzag or other arrangement is used. In an ordinary residential street, anything over 60 ft. is an extravagance. The failure to appreciate the need for variety and the automatic rejection of the unusual is preventing us from ever producing such delightful places as Bath, Chichester or Exeter.

As far as back gardens are concerned, I would regard 35 ft. as an absolute minimum—giving 70 ft. between building faces.

Accepting the undoubted popularity of houses against flats for family living, I suggest we should make more efforts to increase the degree of their inclusion in layouts even of high density. The City Architect of Glasgow, Mr. A. G. Jury, informs me that even in his Gorbals scheme, which has a density of 150 habitable rooms per acre, 2-storey houses could have been introduced but would have entailed a substantial increase in the 4-storey development. I suggest that architects should carry out more studies of layout and design of 2-storey housing for high density areas suitable for redevelopment schemes.

There is a great danger today, when economy of building continues to be pursued relentlessly for its own sake, that the appearance of redevelopment areas will suffer from lack of variety and interest. There is a strong temptation to use standard plans and standard details, and even standard blocks of flats, in order to speed a building programme, but I feel it essential that, within a city, a district should be different from its neighbour. There is much merit in collaboration with private practising architects to help to introduce variety of layout and treatment.

It is extremely difficult to determine what the overall capital cost of redevelopment on the scale now proceeding in Birmingham and elsewhere is likely to be. Estimates made in Birmingham suggest that if all the changes and new building in the redevelopment areas could be carried out at the present time, the cost would be somewhere near £50,000,000 for 1,400 acres.

In Birmingham, I have recently made careful calculations of the cost of developing a central site in various ways, taking into account the cost of buildings, site works, roads and sewers. I chose a

redevelopment site of 12.3 acres with very difficult contours, and produced four schemes, two at a density of 100 rooms to the acre and the others at 140 rooms to the acre. The interesting result of the study was that it was found cheaper per dwelling to build at 140 rooms per acre with 10.3 per cent. houses, 47.9 per cent. 4-storey maisonettes and 13-storey blocks of flats, than to build at 100 rooms per acre with 32 per cent. houses, 16 per cent. 4-storey maisonettes and 11-storey flats.

In conclusion, Mr. Fidler said: 'Rules and regulations form the bases for good planning, but they tend to develop into a strait-jacket unless they are administered in a flexible way. I suggest that our values and standards need constant re-assessment and perhaps now, when redevelopment is getting well under way, the time is ripe for a review of the regulations which will give more scope for progressive design.

Planning Problems of Rural Areas

By GEOFFREY CLARK, OBE, LRIBA, MTPI

NOW that we are getting ahead with slum clearance in these rural areas we are going to come up against the problem of a rebuilding in a big way. Nearly all our villages are closely built either round their green or along what used to be lanes for horse-drawn traffic and when you demolish certain areas of this type of building it is only too easy to destroy the village character, particularly as the sites do not always conform to modern requirements. We are, therefore, going to be faced with a big aesthetic problem and the only solution that can be found is through the closest co-operation between the housing authority, the planning authority and the architectural profession.

One of the greatest problems in planning rural areas is the aesthetic one of dealing with change of scene, either through the removal of natural features such as woodlands, the alteration of historic buildings, the reconstitution of villages, the widening of roads, or the production of public services, water, electricity and, above all, sewage disposal. Success in weaving the new elements into the old and blended scene can only come from the team work of all concerned.

The gist of my remarks is this: that we have no right to demand preservation merely because we are used to a scene. The landscape belongs to the individual owner and he is entitled to deal with his land either as a good forester or a good farmer. We should only become determined preservationists in the very special cases, and this brings me to our new technique of designating out, as it were, of normal planning, areas of outstanding beauty, either as National Parks or else as Section 87 Areas. Here the overriding intention is to preserve the essential character of the scene, and this produces an interesting state of affairs.

Even in these areas the scenery will have to change, but I think the Preservation Authority is bound to take a more conservative view.

Since in these special areas such great care must be taken in the preservation of the essential character of the scenery, I would make a plea for proper financial arrangements since the present method of dealing with the problems that arise from day to day is quite hopeless. In order to preserve and enhance the beauty of these areas there must be a fund at the disposal of the National Park Committee which is independent of local finance and, after allocation, independent of all but Park Commission control.

Nuclear Power Stations

It is sheer lunacy to pass an Act of this special nature and expect it to run itself in the same way as other local government services have to because, quite frankly, you cannot persuade a body of elected members to consider that they have any right to spend ratepayers' money on amenity projects. They will do so in certain special and rather urgent cases, but they will never pursue a policy because finance dominates them and is bound to dominate them. We come to this then, that in dealing with the preservation of our scenery, whether in or out of a Park, we have to use common sense, remembering that change is inevitable. But we have also to remember in those special areas the need to go beyond normal local government procedure.

I should like to come now to certain future developments, and first on this list I would put Nuclear Power Stations. These are part of that Industrial Britain which works on a world scale. These stations are essential to our future industrial progress. It is the fashion at present to say they must not go near urbanised areas, but must be sited by water and away from pockets of dense population. This has meant that some of our most beautiful estuaries, some of our most peaceful country has inevitably been selected for this form of activity. It is no use kicking against the pricks, as St. Paul wisely taught; the power behind this policy is overriding, and we must, therefore, accept in our countryside industrial buildings of this nature. The effect will be local, provided our planning is good, and they should be merely nodal points on the great electricity power grid. Their presence will not be so dominating as to change too much the adjoining settlements, though, of course, they will change the immediate neighbourhood by introducing an industrial note where it never was before.

Let us take another type of development which has come into the countryside in certain particular areas for special reasons. I am thinking of the oil refineries of Esso and Shell on either side of the water at Fawley and Hambledon and still more am I thinking of Milford Haven, that wonderful estuary and harbour in the centre of the Pembroke National Park. Here a combination of circumstances has forced the issue, and it would be entirely wrong planning to try to resist it. Provided the development is not allowed to spread its tentacles into that glorious, curious, sea-swept, beloved area, probably no harm will come, and the economy of that part of Wales will be helped enormously by such a first-class project. The great thing must be, here, to see that no ancillary developments begin to spread outwards from there and introduce the loathsome note of the wrong type of suburbia which can so spoil the beauty of such a scene.

I have tried in this paper to show the great contrast between the Scientific Age which is upon us and that big area of our countryside which is likely to remain comparatively untouched for many decades to come. I have tried, also, to show how difficult it is for a mentality brought up within this progressive, striding, urban atmosphere, to understand the two aspects and the importance of rural areas.

Only the blinded eye of the utter townbred human being could fail to see that the whole balance of any country is upset when you do not have the contrast not only of open space to built-up area but of properly cultivated land which alone can keep a landscape alive, and not only give mental nourishment to the townsman when he wanders abroad, but physical nourishment which he must have. I have made much of this point because it horrifies me to feel a tendency arising which considers the countryside only as Open Spaces, Green Belts, or Designated Areas, and forgets that its true strength lies in the living population which cultivates the fields, raises the cattle, tends the woodlands, quarries the stone, and is spread more or less thinly over the 49,000,000 acres of Rural Britain.

'LANDSCAPE IN MODERN LIFE'

The Challenge of the New Industrial Revolution

AMONG items provided by architects from all over the world for the 'Landscape in Modern Life' exhibition which opened at Birmingham Town Hall on August 30 were Mr. G. A. Jellicoe's scheme for Nottingham University, which is now in progress, and Miss Sylvia Crowe's plan for the Basildon New Town. Other items from abroad illustrate how architects of each country have utilised the natural beauty of their own terrain. American schools are illustrated; community centres built as units in untouched countryside; and some spectacular sports stadiums from both sides of the Iron Curtain.

Speaking at the opening of the exhibition by the Lord Mayor of Birmingham, Ald. J. J. Grogan, MISS SYLVIA CROWE, president of the Institute of Landscape Architects, said that with a new industrial revolution beginning, action must be taken now to preserve our landscape. 'We not only have to repair the ravages of the last industrial revolution but we have to see that there is a new respect for the remaining beauty of our traditional landscape, the finest in the world.'

Where it was not possible for industry to avoid changing the landscape, it had to create a new one of its own, as fine in quality as the old if different in character.

SIR HERBERT MANZONI, a trustee of the Civic Trust (which organised the exhibition), said that in a democracy people always get, in time, what they want sufficiently. 'What we want to do is to create sufficient interest in these things for most people to want the best,' he said.

ACQUISITION AND PLANNING OF LAND IN URBAN RECONSTRUCTION

A Paper at the International Federation for Housing and Town Planning Conference, Berlin

MR. A. G. LING, FRIBA, City Architect and Planning Officer of Coventry read a paper entitled 'Acquisition and Planning of Land in Urban Reconstruction' at the International Federation for Housing and Town Planning Conference held in Berlin on August 26. Following are extracts from Mr. Ling's remarks:

Coventry, originally the third city in England, remained relatively static during the 19th Century. Contributing to this were the restrictions on development on very large areas of land held by the Guilds for common grazing. These lands, known as Lammas and Michaelmas lands, were not available for building until they were released by an Act of Parliament in 1860. The rapid growth of Coventry began at the turn of the century and during the last 50 years the city's population has increased fourfold; it now stands at 272,000.

The boundaries of the city have been increased from time to time to take account of this expansion and they now contain a total area of 19,167 acres. The present discussion is concerned mainly with land acquired under powers conferred by the Planning Act of 1947 to secure comprehensive redevelopment, but post-war building activity in Coventry has not been restricted to the redevelopment of the older and war damaged central parts of the city.

New neighbourhoods have been built on the outskirts of the city and since the end of the war 12,000 municipal houses and new schools providing approximately 25,000 school places have been provided. This has demanded extensive use of the Housing and Education Acts for land acquisition. In addition some of the very large areas in and around the city owned by the Trustees of a Charity founded in the 16th century by a prominent local merchant have been acquired by negotiation thus maintaining the large scale ownership.

Compulsory Purchase

Since December 31, 1949, the Council has made Compulsory Purchase Orders for 428 acres of land. They have been confirmed by the Minister in respect of 314 acres, rejected in respect of 95 acres and a decision is awaited in respect of the remaining 19 acres. Out of the 314 acres which have been confirmed, the actual purchase has been completed in respect of approximately 250 acres and less than three acres of this area have not yet been put to their planned use.

The total area of land within the city owned by the Council is now approximately 6,620 acres, ie, just under 35 per cent. of the total area of the city. This proportion is probably as high if not higher than any other city in Great Britain. It has been acclaimed, even by those who would normally be expected to oppose public ownership of land, as a sound investment for the future.

Of the 6,620 acres owned by the Council 3,515 acres are now developed with buildings or used as public parks; a further 894 acres are zoned for agricultural purposes and is so used at the moment. Seventy-five per cent. of the remaining 1,641 acres is being temporarily farmed pending development in accordance with the plan. These figures are given to indicate that there is a very short time lag between acquisition and development.

This summary of Coventry's extending ownership of land reveals the extent to which the wheel has turned full circle from private to public large scale ownership.

Unified Ownership

History and commonsense alike tell us that comprehensive development or redevelopment of an urban area is virtually impossible unless the land is in a unified ownership. Until the Industrial Revolution at the end of the 18th century, large scale design was possible and usual because there was a large scale ownership of land by the aristocracy. Industrial change began even earlier in the established towns and with it a fragmentation of land ownership.

By 1845 land was changing hands to such an extent that it became necessary to simplify acquisition procedure, and the Land Clauses Consolidation Act was passed by Parliament. This Act did not in itself confer powers to acquire land but simply codified the procedure. The fragmentation of large private ownerships into many small ones has continued and during this century has been accelerated by the sale of land in order to pay high death duties.

It is this vast multiplication of the sources of initiative in development which had done more than anything else to make control of land use and development essential. At first the only restraints on the spread of suburbs without plan were building by-laws, but increasing muddle and decay in the towns led to a growing demand for some form of planning control.

The 20th century arrived, however, before the first Housing and Town Planning Act of 1909 was passed and although town planning law has developed considerably since then, planning control is still a fairly blunt weapon. Experience has shown that it is almost impossible to achieve a satisfactory co-ordination of piecemeal development where the land is split up into numerous small ownerships.

Largely as a consequence of the blitz and in anticipation of post-war planning problems, the Uthwatt Committee was set up in 1941 to report on the financial defects of land use control. It is interesting to note that nationalisation of land was considered by the Committee to be the most logical solution but was rejected because of the political implications and upheaval involved. The Committee recommended a different treatment for land lying outside the built-up areas and land lying within them.

The Uthwatt Committee proposals in a much modified form, as set out in the White Paper of 1944, were adopted as national policy by the war-time Coalition Government. These formed the basis of the financial provisions of Part IV of the Town and Country Planning Act, 1947. The theory was that all land should change hands at its existing use value. The right of owners to development value was not admitted, but it was recognised that hardship might be caused were there to be no compensation at all.

While, therefore, all increased value due to the possibility or actuality of development was to be taken over by the State, arrangements were to be made for an ex gratia payment from a fund of £300 million and a Central Land Board was charged with the administration of the scheme.

In spite of its underlying logical principles, the scheme was misunderstood by the public and was certainly not popular with land owners and developers.

In 1952 the new Government announced its intention of abandoning the financial provisions of the 1947 Act. The £300 million fund was dropped and the Development Charge abolished. Compensation is now limited to those owners whose development rights as existing in 1948 are injuriously affected by planning decisions, and no betterment is collected.

The final result of this retreat was the 1954 Town and Country Planning Act one of the most incomprehensible measures ever to have been passed by Parliament. Planning is now no longer free from the necessity to consider compensation claims in respect of one kind of development as against another, as it would have been under the 1947 Act. It is, however, the Government which is now responsible for paying compensation for loss of development rights as and when this occurs, but without the advantage of any income from development charges imposed on developers where they are making a more profitable use of land.

Compensation

The Government is therefore faced with paying compensation without any balancing betterment and the fact that it has taken powers to itself to call in and revoke planning decisions of the local authorities which involve it in compensation, is an indication of the relatively disadvantageous nature of the present Act.

This is the general background against which the redevelopment of towns in Great Britain has to be considered. The need for compulsory acquisition to enable comprehensive redevelopment to take place was already recognised before the last war in the 1936 Housing Act. Previously powers were limited to the acquisition of sites. With intensive war damage added to prewar decay the need for comprehensive acquisition was even

greater and before the end of the war a new Town and Country Planning Act 1944, was passed by Parliament giving Local Urban Authorities power to acquire land comprising areas of 'blitz' and/or 'blight' on a comprehensive and compulsory basis.

These areas when approved by the Minister were known as Declaratory Order Areas, but they have been renamed Comprehensive Development Areas in the 1947 Act. Financial grants are paid by the Government for the acquisition and clearance of land under these comprehensive redevelopment powers but these have since proved to be not so favourable as to rule out the use of other acquisition powers, e.g., Highways or Education Acts which provide for 75 per cent. grant.

Slum Clearance

The Housing Acts continue to provide for slum clearance outside Comprehensive Development Areas, but with the recent substantial reduction and in many cases abolition of the government subsidies, the financial prospects of public housing are gloomy. The natural tendency has been to use the powers which give the most favourable financial assistance. Since April 1, 1955, the grant rate for transactions under the 1947 and 1954 Planning Acts has been standardised at 50 per cent. of the loss incurred, calculated in terms of the loan charges being spread over a period of not more than 60 years.

In the case of redevelopment this is in respect of the acquisition or appropriation, clearing and preliminary development of the land. Where the land is already owned by the Local Authority it is appropriated out to its new use and grant is payable.

The Ministry of Housing and Local Government requires that where a large area is being redeveloped as a whole the area shall be dealt with in a succession of grant units the size and boundaries of which shall correspond as far as possible with the physical operations involved, e.g., the road and sewer works done as a single contract should be included in one grant unit. The Ministry has indicated that an area that can be redeveloped in a period of ten years is a convenient size. Separate units are made for purposes of relocation of population or industry, where this is effected at a distance from the reconstruction site.

Each grant unit has to be approved by the Minister and for this purpose plans of the redevelopment proposals together with estimates of the cost of acquisition, clearing and preliminary development of land, the value of any land to be appropriated and the value of the land for the proposed new development have to be submitted. Such submission must not be later than the first application for a Compulsory Purchase Order for any part of the grant unit.

Compulsory Purchase Orders are submitted as required for the acquisition of land in the grant unit and these have to be accompanied by a District Valuer's report of the cost of acquisition of land.

The whole procedure of acquisition is unfortunately extraordinarily complicated and time consuming. It ensures that every action of a Local Authority affecting private property is subject to a careful check and provides that the assessment of compensation is made according to the rules laid down under Part V of the 1947 Town and Country Planning Act, as modified by the Town and Country Planning Act, 1954.

Has this system of land acquisition proved satisfactory? Certainly it has enabled the authorities to purchase land for comprehensive development but not without difficulties of timing and finance which have had their effect on the progress of reconstruction. In the early post war years there was no restriction on the extent of land to be purchased within the Declaratory Order Areas and the possibility was discussed in Coventry of floating a reconstruction loan to enable the whole of the 272 acres to be acquired in one operation.

Unfortunately the developing inflationary situation led the Government to place restraints on purchasing activities and in 1949 when the economic situation was particularly critical the Ministry of Town and Country Planning issued a circular instructing local authorities not to acquire land in advance of requirements.

This restriction is destroying the advantages of compulsory acquisition for comprehensive development and turning it into piecemeal acquisition. It means that the authorities are not reaping the full benefits of their reconstruction activities, for when they come to acquire the next parcel of land they have to purchase the increased values which they themselves have created, and the more successful they are in improving values the more they have to pay.

Removing Uncertainty

Acquisition of complete areas or at least the land required for a five-year programme would avoid this. This would not necessarily be against the interests of the private owners of land and property in these areas, for while their land remains unacquired they are uncertain whether or when it will be demanded and are unable to make alternative arrangements to buy land elsewhere and erect buildings.

To sum up the position as I see it. In Great Britain we have powers to acquire the necessary land, but local authorities are forced to use them with too much caution and too much restraint. I remain envious of the planners in Rotterdam who had the advantage of wholesale acquisition of their devastated central area, an inflationary situation being avoided by deferring the payment of compensation until such time as the previous owners of land wished to develop and had spent an equivalent amount on rebuilding.

On the other hand I am sorry for my colleagues in Hamburg who have, I understand, no powers to acquire comprehensively their war damaged areas. I very much hope that this situation will soon change.

TOWN PLANNING DECISIONS

Leatherhead's Fear of Over-population Expressed at Planning Appeals

BECAUSE they fear the area may become over-populated, Leatherhead (Surrey) Council's planning committee have requested an interview with the Minister of Housing and Local Government on Green Belt policy, and have been informed that Dorking and Horley Rural District Council are making similar representations.

Grave concern at the recent rapid growth of Leatherhead has been expressed at recent planning appeals by Leatherhead Council spokesmen, who have asked the Minister to reject many proposals for new buildings and conversions of existing premises.

Buildings at present under construction would bring the district beyond the planned 1971 population target, it has been stated, and other sites could give accommodation for yet another 4,000 people if building were allowed.

These arguments, together with the fear that public services—in particular the sewage works—would be overloaded, were put forward by the council in opposing an application by Professor V. C. Illing to build houses in the grounds of 'The Orchard,' Ottways-lane, Ashtead.

The Leatherhead Council has now been informed that the Minister has upheld Professor Illing's appeal against the refusal.

In the letter giving his decision, the Minister expresses appreciation of the council's concern to limit the growth of Leatherhead, but says he does not think that the proposed development will throw any excessive strain on sewerage or other public services or that it will be likely to lead to demands for additional services which could only be met at the expense of the Green Belt.

The appeal site is allocated for residential development in the Leatherhead Town Map, he points out, and is surrounded by houses. The Minister says he has come to the conclusion that he would not be justified in requiring the development to be deferred.

The council's request for an interview with the Minister has been before the County Planning Committee, who have stated that before approaching the Minister they will consider a full report prepared jointly by Leatherhead Council's engineer and surveyor and the county planning officer.

Leatherhead Planning Committee have received a letter from Mr. Peter Rawlinson, MP for the Epsom Division, saying he will do all in his power to assist the council in ensuring that their representations are considered by the Minister. He offered to approach the Minister before the council's deputation attended him, if the council felt this desirable, and the planning committee have asked Mr. Rawlinson to do this.

Two Surrey Appeals Upheld

THE Minister of Housing and Local Government has upheld two and dismissed one of three recent appeals against planning refusal by Leatherhead (Surrey) Urban District Council.

The appeal dismissed was for permission to erect a dwelling behind another on land

forming part of the Woodbridge Nurseries, Oxshott-road, Leatherhead. The Minister considered this undesirable and said that he was not convinced that another dwelling was required on the six-acre holding for its proper management.

Upheld, however, were the appeals for the continued use of 'Greenroof,' The Common, Ashtead—a wood and asbestos building about 143 ft. by 20 ft.—as a light industrial building, and for the erection of a mushroom shed on land on the south side of Bunny's-avenue, Woodlands-road, Little Bookham.

Permission was given by the Minister for the use of 'Greenroof' for a period of 10 years from August 22, 1957, subject to the use ceasing at the end of that period, and the site being kept tidy and clear of refuse and waste materials.

He considered the erection of the mushroom shed was not inappropriate in the Green Belt, as claimed by the council, neither did he share the council's fears that the granting of permission would be likely to lead to development which would adversely affect the appearance or the character of the district.

BOOKS

∴ *Books reviewed in these columns may be obtained on application to the Book Dept., 'The Builder,' 4, Catherine-street, Aldwych, WC2. Cash (which should include 1s. to cover postage and packing) should accompany the order.*

GOTHIC CATHEDRALS AND SACRED GEOMETRY: By George Lesser. (London: Alec Tiranti.) Price 42s.

WHEN an author has spent 20 years on the study of a subject and the production of a book, his work is entitled to our attention and respect. Mr. George Lesser has brought much thought, an impressive degree of knowledge, experimentation and research to his 'Gothic Cathedrals and Sacred Geometry.' Whether he has proved his case is difficult to say. For one thing, acceptance of his findings appears to depend on the acceptance of certain fundamentals on which some of the deepest thinkers have been unable to agree. If that, on the one hand, is so much the worse for the thinkers it may be, on the other, so much the worse for the fundamentals. The author's thesis, that the highest productions of sacred architecture conform to a geometric, or geometric-arithmetic, structure, is no new thing. It is a proposition which seems to have had a peculiar fascination for artists and architects of the Renaissance, and many erudite essays have since appeared in support and furtherance of the idea.

Unquestionably many buildings which in their proportions satisfy the mind, or the eye, or what is conveniently termed the mind's eye, can be shown to conform to a geometric pattern. But has it been conclusively shown that every building which, in general, satisfies the mind's eye is equally conformable? They may not be; but if they are, the contention here put forward is that they owe the satisfaction they arouse to their geometric structure. But it is not to be supposed that any geometric structure would necessarily produce a similarly satisfying effect. Clearly it would be possible to pose a geometric combination which, however unexceptionable from the purely geometric viewpoint, would, if applied to a building, produce a result of a far from satisfactory character. It is just by that reflection that a hesitancy to accept in full the validity of the geometric-arithmetic theory finds a rational defence.

It means this: that the geometry to which a building shall conform must be selected geometry. In other words, the dominant control, in the last analysis, is not the pure geometry, nor the pure arithmetic, but the selective human mind. And the human mind, being frail and probably far from pure, takes in many things which geometry leaves out. Again perhaps, and for the purist, so much the worse for the human mind. But there it is.

It is only too easy to denigrate a valuable idea by going to extremes or to raise a doubt by choosing an egregious parallel. For instance, a module may have far more than a commercial value, but if it is reduced to a minute dimension it ceases to have meaning. Or it may be recalled that attempts to prove the geometric basis of the design of Doric temples depended for success on the careful selection of examples to which it would apply. None the less, that there is a close connection between geometry and design no one who has had to do with it will doubt. The question is not as to the existence of the relationship but as to the extent of it. Any book which helps to explore this question must add to our defective knowledge. It will be surprising if this thoughtful work does not take us a stage further along what may prove to be a journey without end—the understanding of the mainsprings of creation. JAMES BURFORD.

CURTAIN WALLING. With an introduction by Edward D. Mills, FRIBA. 34 pp., fully illustrated. (London: Iliffe and Sons, Ltd.) 2s. 6d.

ALTHOUGH curtain walling is not new it is only recently that it has been adopted on a wide scale. Its use leads to considerable economies in structural framework and foundations, saving in space and erection time, earlier weather protection and better insulation.

This booklet contains a reprint of an article from *The Architect and Building News* giving 16 examples of proprietary curtain walling systems, tabulated details of infilling panels and names and addresses of manufacturers and suppliers. In addition there are four examples of actual designs from English, American and German sources, together with their detail sheets. The whole is preceded by a four-page explanatory introduction by Mr. Edward D. Mills, FRIBA.

BOOK RECEIVED

STONES OF BRITAIN. By B. C. G. Shore. 302 pp. Illustrated. (London: Leonard Hill (Books) Ltd.) Price 66s.

Iron Castings Production

Production of iron castings in the second quarter of 1957 at 944,500 tons was 7½ per cent. lower than in the same quarter of last year, according to the Joint Iron Council. Nevertheless, despite the overall reduction, the output of the 'building and domestic' section increased in the same period from 140,900 tons in 1956 to 142,300 tons in 1957.

NEW MANAGEMENT COURSE

Joint BIM and Regent-street Polytechnic Venture

A NEW four-week residential course, jointly sponsored by the British Institute of Management and the Department of Management Studies of the Polytechnic, Regent-street, W1, will be held three times during each academic session. The first course will begin in November next.

This is the first senior educational programme of this kind jointly sponsored by the British Institute of Management and the Polytechnic.

In its organisation and sponsorship as well as in the methods which will be used, this new course is an important departure from current management training. It is the first time that the combined resources of a major professional and academic body will be made available to a senior executive training programme.

The Department of Management Studies of the Polytechnic, Regent-street, will be responsible for the organisation of the course. A staff of highly qualified full-time and part-time lecturers from the department and from industry and commerce will work under the director and an assistant director of the executive programme.

Aim of the Programme.—The executive programme is carefully designed to give managers the opportunity to practise executive skills in a very broad setting. The formal teaching programme will concentrate on discussing some of the new developments in management theory and management practice, recent research findings, and the experience of successful managerial methods in various countries.

The programme will stress the importance of seeing each technical and administrative function as a contribution to the effectiveness of the whole organisation.

A major theme will be the need for adaptability to change. The aim is to develop the executive's capacity in dealing with situations of this nature.

Admission.—The course is designed for 20 selected executives nominated by their firms. The fee is 100 gns., including publications. Hotel accommodation will cost approximately 60 gns. in addition to this fee. Details from The Director of the Executive Programme, Department of Management Studies, St. Katherine's House, 194, Albany-st., W1.

HOUSING PROGRESS REPORT

Figures for July

THE Housing Summary presented to Parliament as a White Paper* jointly by the Minister of Housing and Local Government and the Secretary of State for Scotland, shows that the number of permanent houses completed in Great Britain during July was 24,410 compared with 24,995 in July, 1956.

In the first seven months of 1957, 176,815 permanent houses were completed compared with 169,407 in the same period of 1956.

* Cmd. 245 Housing Summary, July 31, 1957. HM Stationery Office, price 3d.

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Mr. Norman Longley, president of the International Federation of Building and Public Works, and Mr. Julian S. Tritton, president of the International Federation of Consulting Engineers, signing the agreement for an international form of civil engineering contract at Zurich, on August 29. On the left is Senator Linsenhoff, of Germany

INTERNATIONAL CIVIL ENGINEERING CONTRACTS

Agreement on Standard Conditions

AGREEMENT has been reached on the conditions of a standard form of contract for works of civil engineering construction which are the subject of international tender, reports the National Federation of Building Trade Employers.

The formal signing of the document, which is the culmination of two years' joint discussion and negotiation, took place in the Kongresshaus, Zurich, on August 29, at a conference of the Federation Internationale du Batiment et des Travaux Publics (International Federation of Building and Public Works). The signatories were Mr. Julian S. Tritton, MICE, MIMechE, president of the Federation Internationale des Ingenieurs —Conseils (International Federation of Consulting Engineers), and Mr. Norman Longley, CBE, president of the Federation Internationale du Batiment et des Travaux Publics.

These two international organisations, states the NFBTE, have unrivalled knowledge of the conditions under which civil engineering contracts are carried out throughout the world, and by jointly preparing and agreeing this standard set of conditions they have made available an equitable document which holds the balance fairly between employers and contractors and which should be of great assistance to employing authorities and others responsible for carrying out development programmes.

An Important Document

With vast constructional programmes in hand in nearly all countries—hydro-electric schemes, power stations using oil, coal or nuclear fission, dams, ports, harbours, tunnels, roads, railways, airports, oil refineries, pipe-lines, irrigation schemes, townships—the importance of such a standard document is immediately apparent.

An interesting feature of the conditions is a provision under which the procedure of the court of arbitration of the International Chamber of Commerce will be used for the settlement of any disputes that may arise.

By providing a standard to which all countries, both developed and under-developed, can subscribe, the two federations have made a substantial contribution to the smooth administration of constructional projects in all parts of the world. There has long been a need for such a document.

Initially, the conditions have been printed in English, but French and German translations will be available shortly, and translations into other languages are contemplated in the near future. A copy of the conditions of contract is to be presented to the World Bank.

Mr. Tritton was accompanied by his vice-president, M. Georges Bory (France), and his immediate past-president, Mr. Robert A. Naef (Switzerland), while those present at the formal signing also included Senator Linsenhoff (Germany), M. Andre Borie (France), and Sir Andrew MacTaggart (Great Britain), who have taken a prominent part in the negotiations leading to agreement on the conditions. The Société Suisse des Entrepreneurs and the Groupe des Entrepreneurs Suisses de Travaux Publics were acting as hosts for the conference.

Copies of the conditions of contract are obtainable from the Export Group for the Constructional Industries, 21 Tothill-street, London, SW1, and the Association of Consulting Engineers, 36 Victoria-street, London, SW1.

The membership of the FIDIC includes the national consulting engineering associations of Belgium, Denmark, Finland, France, Germany, Great Britain, the Netherlands, Norway, Sweden, and Switzerland. The membership of the FIBTP includes the national building and civil engineering contracting organisations of the ten countries mentioned and of Argentine, Austria, Canada, Greece, Italy and Luxembourg.

LINCOLN BUILDERS' PROTEST

Not Asked to Tender for £175,000 Contract

BECAUSE BUILDERS in Lincoln and district did not have an opportunity to tender for the erection of a new £175,000 bus station in St. Mark's, Lincoln, for the Lincolnshire Road Car Co., Ltd., the Lincoln and District Association of Building Trades Employers has protested, and Lincoln and District Trades Council, which represents 25,000 employees, has called for a public inquiry.

Mr. Geoffrey de Freitas, MP for Lincoln, took up the matter with Sir Brian Robertson, chairman of the British Transport Commission, but Mr. David Richmond, secretary of the Association of Building Trades Employers received a letter from Mr. A. Briggs, architect for the Tillings Association, Ltd., of which the bus company is a member, which stated that no Lincoln builders would be asked to submit a tender 'because there was no time.'

Mr. de Freitas has been asked to raise the matter in the House of Commons and it is expected that this will be done when Parliament resumes.

LMBA

Firm Price Tendering

TO find out how far firm price tendering is being operated and to watch the progress of the system, the LMBA is circularising all its members inviting them to make quarterly returns of the contracts accepted on a firm price basis. In particular it wants to know how far the recommendations on pre-contract planning are being operated.

Visit to Interbau Exhibition

TWELVE members of the LMBA's North-Eastern Area left London Airport last Friday on a week's visit to Interbau, the International Building Exhibition now being held in Berlin. They included Mr. H. J. Horn, chairman of the area, and Mr. A. G. Miles, who last year was one of the LMBA vice-presidents. Mr. P. A. A. Gatehouse, the area secretary, is accompanying the party.

The party is being welcomed officially to Berlin by the City Senator for Building and Housing, and the Bund Deutscher Baumeister, Architeckten und Bauingenieure are entertaining them to dinner. In addition to visits to the building exhibition, the party will see many of the new buildings which are under construction in both East and West Berlin.

BRITISH STANDARDS

Domestic and Non-industrial Electrical Installations and Appliances (BS Handbook No. 9: 1957)

THIS REVISED BS Handbook No. 9 (price 25s.) includes not only revisions of existing electrical standards but a large number of new ones, so that it now contains almost twice as many summaries as the 1949 edition. The publication is intended to form a useful companion volume to the Regulations for the Electrical Equipment of Buildings (the 'Wiring Regulations') issued by the Institution of Electrical Engineers, in which reference is made to the majority of the British Standards summarised in the handbook.

These summaries give the principal requirements of standards covering domestic and non-industrial installations and, as was announced in the first edition, the opportunity has been taken to summarise recent standards for domestic applicances. The contents of the volume are arranged in the numerical order of the British Standards, with the main index relating to these numbers and not to the page numbers. A subject index has also been included for easy reference.

It is hoped that these summaries will continue to enable architects, consultants and contractors and others concerned with electrical installations to select standard sizes and that they will be sufficient to indicate the types and quality which the British Standards establish.

FIRM PRICES

EJMA'S Attitude Defined

FOLLOWING is the text of a letter concerning fixed price tendering which Mr. R. G. Harvey Greenham, Secretary of the English Joinery Manufacturers' Association, has sent to the Ministry of Works with copies to the Board of Trade, The Federation of British Industries, and to The National Council of Building Material Producers.

COPY

The statement made by the Minister of Works on April 30, announcing the Government's intention to invite tenders on a fixed price basis for all building and civil engineering work carried out by their Departments in the future, and at the same time inviting both the local authorities and the nationalised industries to adopt a similar policy, has now been considered by my Council.

You will recall that so far back as September, 1954, the Council of the English Joinery Manufacturers' Association asked all members to quote firm prices wherever possible, and where deliveries were required to be made within a reasonable time, subject only to any nationally negotiated wages variations, and again, in February of last year they informed members of the Association that provided wage rates remained constant, they saw no reason to anticipate any rise in the cost of housing joinery in 1956.

Since September, 1954, the building trade rates of wages—which are observed by the joinery industry—have advanced by 9d. per hour (Grade A) for craftsmen and by 8d. per hour for labourers. These figures are arrived at by an increase in the basic rates for craftsmen of 6½d. per hour, and of 2½d. per hour under the cost of living sliding scale agreement, and 2½d. per hour for labourers under the cost of living sliding scale and 5½d. per hour in their basic rates.

The last increase was only granted as from May 27 last, but the Amalgamated Society of Woodworkers have already instructed their representatives to put forward a demand for a further 6d. per hour in the basic rate of wages, and there is the probability that in February, 1958, there will also be due under the cost of living sliding scale, a further wages increase.

You will also have noted, as have my Council with the utmost concern, that close upon the Government's decision with regard to fixed price contracts, the National Coal Board has given notice of a further rise in the cost of coal, which will affect production costs, not only directly but also indirectly, by its cumulative effect on manufacturing and distributing costs generally, and, as a trade wholly dependent on imports for its raw material we are also subject to other conditions outside this country's control, such as freight rates and the policies of timber producing countries. An example of this is the case of Parana Pine, used in quite large quantities by the joinery trade, which, in the space of six months, at the end of 1955 and beginning of 1956, jumped from £105 per standard at port to £125 per standard.

Whilst my Council is anxious, as its past record has shown, to assist the Government to the best of its ability, they cannot help feeling that if the cost of labour and of materials is to be subject to increases during the next two years, unless the manufacturer is to insure against such contingencies by quoting a higher price to cover the risk involved, which would nullify the object the Government have in mind, it is practically an impossibility for the manufacturer to undertake to quote on a two years' fixed price basis.

[Signed] R. G. HARVEY GREENHAM.

Implications of New Scottish Development

THE FIXED-PRICE TENDER scheme which has been operating in Scotland has raised a further interesting and important aspect in the claim advanced by a firm of contractors against Glasgow Corporation for payment of an extra £6,500 for increased cost of materials, writes a correspondent. The claim has been admitted as a reasonable and accurate one arising through delay in acceptance of the contract within a specified time.

The secondary school involved was cut from £547,323 to £389,603 to comply with Scottish Education Department requirements. The firm involved accepted the contract on the basis of acceptance by the Corporation of their quotation within three months. In that event the contract became a fixed-price one.

If, on the other hand, the Corporation failed to accept within three months the firm reserved the right to charge for increases in cost of materials arising within the period. The offer was not accepted within the three month period and the firm now claimed, justifiably, for the increased costs.

Reporting on this situation, the convenor of Glasgow Education Committee pointed out on August 30, that most contracts could be accepted within the three months period, but secondary schools raised problems which prevented checking within the three months.

A Vexed Problem

This situation indicates one possible method of handling the very vexed problem of fixed-price tendering; if insistence is maintained on fixed prices, contractors in turn are undoubtedly entitled to acceptance within a reasonable period of quoting and the three months period appears liberal. The complications arise when a number of bodies are involved, where assessment and reassessment are necessary and where checking and cross checking are ultimately necessary.

It has been indicated that for some contracts the three month period is not adequate and that longer periods may be required. In such cases the contractor must be entitled to such protection as can be devised, to offset his risks against fixed price tendering, and the fixing of a time limit for acceptance seems one reasonable method of protection open to the contractor.

The length of time allowed for acceptance must vary; three months seems an excessive period in many cases since price rises are liable to happen at very short notice. A one month acceptance period might well be indicated as a limit, if only to pass some of the burden to the customer.

NEWS IN BRIEF

Private Secretaries to Minister

MR. HENRY BROOKE, Minister of Housing and Local Government and Minister for Welsh Affairs, has appointed Mr. R. O. C. Winkler to be his Principal Private Secretary in succession to Mr. A. Sylvester Evans. He has appointed Mr. P. I. Wolf to be his Assistant Private Secretary.

Chinese Trade Mission

A Chinese Technical Mission will shortly visit this country following an invitation extended by the Sino-British Trade Committee, states the *Board of Trade Journal* of August 30. The mission is expected to arrive in the latter half of September and will, it is understood, be interested particularly in the following industries: iron and steel, including steel making plant; electrical engineering, including electronic equipment, radio and television equipment and cables; motor vehicles; agricultural machinery; heavy machinery, including machine tools, furnaces and mining equipment. Firms who wish to make contact with the Chinese mission should get into touch as soon as possible with the special China Trade Mission Liaison Office which the Sino-British Trade Committee have set up at 21 Tothill-street, SW1.

Housing Act, 1957

The Ministry of Housing and Local Government have informed local authorities (in Circular No. 46/57) that this Act into operation as from September 1. The Act repeals and re-enacts in consolidated form the provisions of the earlier Housing Acts, with the exception of financial provisions which will be consolidated in a separate Bill next Session. The Housing Act, 1957, is divided into eight parts which follow generally the arrangement of the Act of 1936 with the necessary modification and expansion. There are also eleven schedules to the Act in which there are changes in arrangement, the most important of which is that the provisions relating to the compulsory purchase of land under Parts II, III and V of the Act which were contained in the First Schedule to the Act of 1936 are reproduced separately in the First, Third and Seventh Schedules respectively.

The Ministry have also issued Circular No. 45/57, on Improvement Grants, which states that in consequence of the repeal of Section 22 of the Housing Act, 1949, a new form of approval of applications for grant and a new form of application for grant have been devised.

COMPANY NEWS

As announced earlier this year, **John Laing and Son (Holdings), Ltd.,** and **Holloway Brothers (London), Ltd.,** have reached agreement in principle to the future operation of the Holloway Company in association with the Laing Group. As a result of this agreement the following appointments have now been made to the Holloway Board: E. C. Uren, chairman; W. M. Johnson, deputy chairman; D. P. Marriott, F. S. Hockaday, E. R. Beecher and H. E. Hodgson. Holloway Brothers (London), Ltd., will continue under the management of the Holloway family with P. W. E. Holloway as managing director and the remaining members of the board, L. J. Holloway, P. H. T. Holloway, V. H. Holloway and B. I. Palmer.

Laminated Timber Construction in Europe

FINDINGS OF A RECENT TDA INVESTIGATION

THE news that Hampshire County Council has placed a contract for 300 glued laminated timber beams for use in the construction of schools indicates, according to an interim report by E. LEVIN, ARIBA, Chief Architect of the Timber Development Association, that architects and engineers in Britain are awakening to the structural possibilities of a technique which has been employed widely in Europe for nearly 50 years and in recent years, on a more ambitious scale, in Canada and the United States.

In March last year the Organisation for European Economic Co-operation (OEEC) published a comprehensive report ('Laminated Timber,' from HMSO price 10s.) based on the findings of a team of experts who made a six weeks' tour of timber laminating plants in the USA. Although that document contained a wealth of technical data, the Timber Development Association felt that similar information about European developments was essential before the potentialities of the 'glue-lam' technique could be assessed, since costs of raw materials and labour in Europe afford a better comparison with costs in this country than those charged to the laminating industry on the North American continent.

A complementary survey has therefore been initiated by Mr. E. Levin, who recently visited some of the principal laminating workshops in Switzerland, Belgium and Holland, and investigated the position in Germany and France. It is hoped that investigations will be extended this year to the timber producing countries of northern Europe—Sweden, Norway and Finland.

Modest Plant Needed

In Europe Mr. Levin found ample confirmation of the view that glued lamination is not necessarily a big industrial undertaking but can be carried out quite profitably in factories equipped with modest plant and staffed by a small labour force. While a continuous flow of production obviously makes for economy, relatively small workshops coping with an intermittent demand still manage to make fabrication pay.

Reviewing economic questions from the standpoint of future glued laminated timber developments in Britain, Mr. Levin concludes that special study should be devoted to the types of glue employed, since the cost of adhesives figures prominently in the final price of products. He sees a future in the production of straight beams and long radius curves because these permit thicker laminates and fewer glue lines.

Standardisation of components can also have an important bearing on the wider adoption of glued lamination in this country, and he argues that there is no reason why for certain types of buildings—factory sheds, for example—standard frames should be unacceptable in timber when they are already widely accepted in steel and reinforced concrete.

In an estimate of developments country by country, Mr. Levin emphasises interesting contrasts. Possession of domestic timber resources in general does not appear to have much influence on 'glue-lam' operations, so that Switzerland, with comparatively little timber of her own, ranks as one of the most advanced centres of the lamination industry. In Switzerland and Holland progress has followed widely different paths. Swiss woodworkers, for example, have absorbed glued lamination methods into everyday practice. Mr. Levin found that there were no Swiss firms specialising in laminated components and structures although the practice of lamination has become almost universal.

Many woodworking firms, carpenters and sawmillers, the bulk of whose business lies in other fields, were able to produce laminated timbers and in most cases also to carry out erection on the site.

By contrast, lamination in Holland is a separate industry working on a whole-time basis. Output from the industry as a whole goes mainly to the building industry in Holland which, Mr. Levin reports, is becoming increasingly 'timber-minded.'

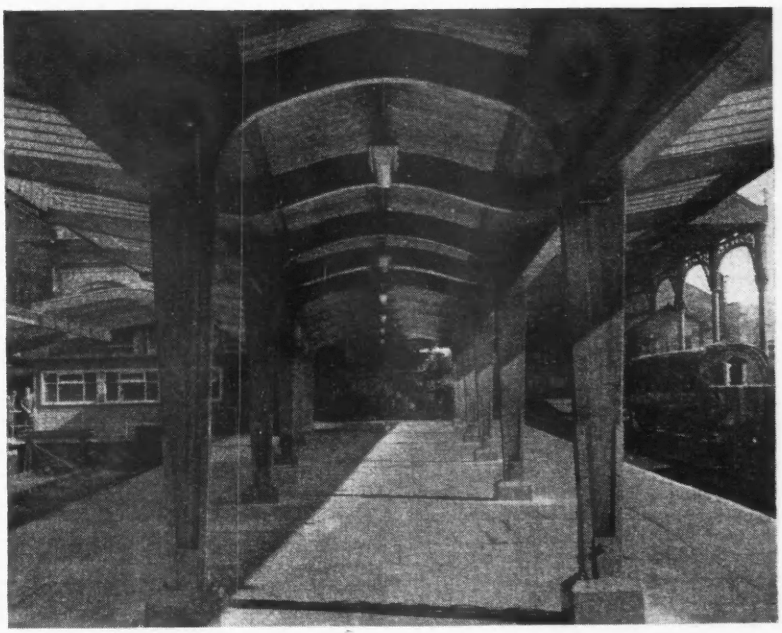
Production of laminated timbers in Belgium is concentrated in the hands of two large firms, both of them active in other branches of the woodworking industry. For its size, France appears to be well behind its neighbours in advanced timber constructional techniques, and Mr. Levin could discover no lamination industry worth mentioning, though there was some evidence of isolated and ingenious use of it.

Production 'Meagre'

Although Germany was first in the field with glued lamination in the years before the first world war, and although Otto Hetzer, the father of laminating principles, influenced timber engineering all over Europe, present-day activity in production is meagre and disappointing. Mr. Levin was unable to uncover all the reasons for this decline but among the factors he considers significant are (1) successful competition from glue-jointed timber lattice girders with a lower timber content than solid laminated structures, (2) restrictive codes of practice (introduced at the height of the Allied fire offensive against Germany) which have not yet been revoked and (3) problems created by the use of unsuitable adhesives in the early years of development (problems which have now been overcome).

Mr. Levin also believes that the inflationary crisis of the 'twenties laid the main seeds of disruption in the German laminating industry. The German scene, however, is not uniformly black and Mr. Levin noted signs of reviving interest in modern applications of this constructional system.

By comparison with the American



TIMBER RAILWAY STRUCTURE.—The use of laminated timber for a recent reconstruction of the roof over two platforms at Preston Station marks the first time this form of structure has been used on the London Midland Region of British Railways. Douglas fir was used for the laminates, glued with 'Cascophen Resorcinol' resin glue with a catalyst, manufactured by Leicester Lovell and Co., Ltd.; the components were made by J. Samuel White and Co., Ltd., and the structure was designed by J. Taylor Thompson, London Midland Chief Civil Engineer

lamination industry, which has been able to introduce mass production methods on a considerable scale, production of laminated members in Europe is still largely a craft affair. Mechanisation does not in general extend beyond the machining of laminates. As far as Mr. Levin could ascertain, there is no factory on the Continent offering a range of standard components 'off the shelf.' Nor are there in any of the countries so far visited national standards for laminated components or 'preferred dimensions' and shapes. European architects are reputed to be highly individualistic and like to take full advantage of the possibilities offered by the laminating technique to produce ever new shapes and sizes.

In Switzerland, where costs and conditions bear comparison with UK standards, Mr. Levin scrutinised fabrication fairly closely. In general he found that labour and materials costs were roughly equal in small workshops run on the craft pattern, but he notes in his report that in the most modern of the plants visited, where the flow of production appeared to be faster and better organised, the ratio of materials to labour costs was nearer 2:1. He estimates that the consumer pays about three times more for the laminated timber in a structure than the unprocessed raw material would cost.

Regarding competition with other structural materials, Mr. Levin estimates from studies made in Holland and Belgium that for spans over 35 ft. laminated timber construction is competitive with reinforced concrete and steel. In the two countries mentioned, prestressed concrete is regarded as the most serious competitor. For very large spans (100 ft., 130 ft., and 160 ft.) laminated timber—makers in the Netherlands claimed—can be supplied for as little as half the price of reinforced concrete. He adds that Swiss firms claim that laminated timber is fully competitive once spans of 40 ft. and over are reached and is invariably cheaper to use for really large spans.

'STYLE MAKETH MAN'

Address at the Council for Visual Education

MR. LESLIE HARDERN read an address entitled 'Style Maketh Man,' in the absence of Mr. Henry Morris, CBE, MA, at the fourteenth annual meeting of the Council for Visual Education, held recently at the Housing Centre, SW1.

Before reading the address, Mr. Hardern paid tribute to the Council's late President, Professor Sir Patrick Abercrombie, who he said had been not only a great man but also a very distinguished architect and town planner, and much interested in matters with which the Council was concerned. The best the Council could do in remembrance of him was to carry on with the work in the way in which he would have wished. The General Committee had unanimously approved the nomination of Lord Euston as his successor. He also was very interested in the Council's work and would continue to lead it on the same lines as Sir Patrick had done.

End of Traditions

Following are extracts from MR. MORRIS's paper: The age of industrialism and democracy has brought to an end most of the great cultural traditions of Europe, and not least that of architecture. In the contemporary world in which the majority are half-educated and many not even a quarter educated, and in which large fortunes and enormous power can be obtained by exploiting ignorance and appetite, there is a vast cultural breakdown which, as we approach universal literacy, will stretch from America to Europe and from Europe to the East.

One effect of the breakdown to which I refer is to be seen in the disintegration of the visual environment in highly civilised countries in Europe with a long tradition of humanised landscape occupied by villages and towns of architectural character, sometimes of moving beauty. The march of squalor proceeds from the Eastern hemisphere to Africa and then to the West. In its grimmest and most cruel form it is to be found in industrialised countries, for instance in large parts of the United States.

The great failure of our civilisation to-day is aesthetic. The failure is universal and exists on every level of society, not least in our upper professional, commercial and academic classes. This visual illiteracy amongst our highly-educated classes is an astonishing phenomenon. People of great taste in literature and music, mathematicians and scientists with a sense of order and truth are frequently visually illiterate and aesthetically stone-blind.

The domestic interiors of Oxford and Cambridge and of all the other universities show that the men and women upon whom our contemporary civilisation depends, are mostly unaware of any aesthetic style and standard. As patrons of architecture and the visual arts the universities, including Oxford and Cambridge, have in modern times always preferred the conventional, the academic, the imitative and the backward-looking. They have been far too gentlemanlike. Witness the physical appearance of some of our universities, Manchester, for instance, where the visual arts, I am told, are looked upon as a frivolous waste of time. Look how in our latest university college, that of Keele in Staffordshire, a brave attempt is being made to combine in proper measure the humane with the scientific and the technical.

It is to contemporary architecture that we should look for a creative renaissance in art to-day and the appreciation by men and women everywhere of the relevance of the arts and of the artist to their lives. This is the concrete and empirical approach. We could well do with a cessation of metaphysical art-theorising. We should, for a time, banish the Art Historian from the Republic!

I mean by architecture the ordering of the whole of our visual environment, and in architecture thus conceived I include not only the architect, the engineer and the craftsman, but also the sculptor, the painter and the landscapist. I think that a society in which architecture is thus conceived and carried out, will prove to be sensitive and original in all the ancillary parts of a civilised life.

'The Great Public Art'

It is imperative that the architectural profession should provide itself with a discipline in sensibility and style available *during* training and *afterwards* in professional life so that they might in all localities take the lead in maintaining standards of taste in all visual things.

We are living in a world dominated by applied science and technology. The necessity for the artist, who sustains humane and personal values, is greater than ever. Certain creations of the artist, such as music, literature and painting, we are able to obtain and enjoy in our private capacities. But architecture as the great public art to whose influence all are subject can only be provided by Society, and be it noted at the hands of the architect who is an artist.

Modern architecture, which is the result of new structural principles and materials with a mechanical logic of their own, is confronted with an imperative which it must obey. This is that, in addition to its practical utilitarian functions, modern architecture must nourish humanist values, especially in its external service of expressing the significance of man's activities, of giving nobility to his environment, and ministering to his delight and appetite for beauty. It is not to be contemplated that modern architecture will fail to do this.

Beauty and the Aesthetic are as important for us as food and air. We have to make the fostering of taste and style, of sensibility to good design and beauty, a first imperative in our culture, as important and necessary to man as science and scientific method. Nothing less than that will do.

I am thinking mainly of the visual arts and the ordering of our environment, though the imperative should apply equally to all the arts, for instance to music and literature. Something is already happening. The Council of Industrial Design is influencing colour and style in many of the articles of daily use. There has been a revolution in school building. The university graduates have picture clubs and are buying original pictures and consigning reproductions to the flames or to folders, where they ought to be kept perpetually.

Let me deal with all this in broad outline: architecture, the ordering of our visual environment, landscape, trees, colours, design, should be a major part of all school life. People will say there is not time. But our visual environment is a priority. There is a great deal of waste of time in all secondary schools,

not least in secondary modern schools.

We must not forget the supreme importance of architecture in the life of man because of its public character. It is our subtlest form of compulsory aesthetic education. It is a profound necessity for civilisation that modern architecture should discharge its external function of ennobling and giving significance to our environment and to do so in terms of humanist values. This has just got to be done in the building of schools. And school building must be kind and felicitous to children and adolescents.

It cannot be too clearly pointed out that the aim of education in art is the stimulus and training of sensibility. Fortunately, a great change and advance has taken place in the practice of art in schools during the past 25 years.

I must now come to adult education—the importance of which in an age of technology, democracy and leisure is supreme. I have said in the past that the centre of gravity in the public system of education should lie in that part of it which provides for youth and maturity. Without adult education a great deal of what is done in schools is wasted, for it is in adolescence and youth that we really begin to understand the significance of science, fully to appreciate great literature and music and to enjoy great visual art. We make a great mistake in attempting, too, to introduce children too early to works of art which are beyond their experience.

To come to smaller things. In many universities—and certainly at Oxford and Cambridge—young men and women are taking a renewed interest in pictorial art such as was unknown 25 years ago. But pictures are not enough. I would plead that those young people at universities (and the dons too!) should have means of acquiring an appreciation of architecture and landscape, and the meaning of town and country planning.

And then there is adult education in town and country, mainly for leisure, carried out in the evening and at weekends. It has been too largely didactic in the past and here there is a big field for the visual arts and the appreciation of architecture and landscape.

In education, the prime instrument for developing taste and sensibility is a building which is, within and without, a work of architectural art and with an environment which is an example of the art of landscape. The method is that of habituation—not discourse and preaching.

Discussion

MR. MARSDEN-SMEDLEY, Mayor of Chelsea, opened the discussion. He regretted that Mr. Morris had not been able to deliver his paper himself, because one could not throw even a metaphorical ripe tomato at an absent speaker, and still less at his understudy.

He had listened to parts of the talk with the greatest interest; and in particular to the criticism of the lack of beauty in the surroundings of modern universities. He pointed out that it was just these modern universities which had been designed by architects. He was much in agreement with Mr. Morris's view that education was becoming too specialised. He was horrified at what was happening at some of the newer universities and so-called Schools of Advanced Technology. It was important to have a fairly balanced curriculum.

COLONEL H. P. CART DE LAFONTAINE thought that the architects were often not so much at fault as their clients; they had to spend half their time trying to educate clients who had not been trained to see things.

MRS. DOROTHY JENKS, of the Ecclesiological Society, felt that architects should be firm, and not allow their clients to dictate to them, any more than patients could dictate to their doctors. It was true that the architect was taking his client's money, but he should never forget that by putting up a bad building he was offending the sight of people who recognised and appreciated beauty.

She commented particularly on some of the terrible schools in which children received their education, and the ugliness of some of the yards and bombed sites which were their habitual playgrounds.

A Successful Venture

THE HON. MRS. MELDON referred to the success of the Council's Essay Competition; 251 entries had been received. The project was, she believed, important not only from the point of view of the visual arts, but also as a means of combating juvenile delinquency.

MR. C. B. WILLCOCKS advised that the Essay Competition was being found very useful by teachers. In one school try-out essays had been written in connection with this year's competition on 'The House I Would Like To Live In' and, whilst several children had given their ideas of modern labour-saving houses, one had described Buckingham Palace! The competitions encouraged children to use their eyes.

MR. MARSDEN-SMEDLEY said that many colleges at Oxford and Cambridge dated back before Wren. He felt that the real attraction of the older universities depended on what might be called the high table atmosphere, with its mingling of science, philosophy, classics, and so on. Today the technique of architecture was almost perfect, and what was needed now was to influence the modern patron.

MRS. JENKS pointed out that she had been concerned only with the visual impact of ugly surroundings on young people.

MR. WILLCOCKS, referring to the previous speaker's remarks about the design of some modern schools, said that, whilst many new schools and factories were very much better designed than numerous old ones, he had recently been looking at a modern school of which the external design was so unsatisfactory that he wondered how anyone brought up in such an environment could have any appreciation of beauty.

MISS SYDNEY FOOTT, of the Council of Industrial Design, agreed that it was most important to get people, and particularly children, to look at things, and to make up their own minds about them. She thought we ought not to despair of old school buildings, for the LCC and some other authorities had done a lot for them recently by repainting, and some were as attractive in their interior decoration as the new schools, though not, of course, outside.

MR. GORDON SUTTON referred to comments from some speakers comparing the more recent universities with Oxford and Cambridge. In fairness to the newer universities it should be remembered what they had accomplished. At Nottingham, for example, there was a permanent gallery for Art Exhibitions and studios where students could paint. He doubted whether the older universities provided such opportunities for their students.

MR. W. G. HOWELL said it must always be helpful if the architect could establish a happy relationship with his client. Clients were essential to architects; they must have someone to build for, and only together could they get things going. He paid tribute to the work of Mr. Morris as County Education Officer at Cambridge, and in particular to what he had done in connection with further education.

MISS ADKINS spoke of the way different housing estates developed according to the amenities provided. On one estate in Coventry the tenants had settled down rapidly into a flourishing and happy community, and it was in every way a success. On another the ground was extremely poor, so that it was impossible to make anything of the gardens. Here the atmosphere was entirely different; the people were wooden-faced and drab, and on a third estate a new shopping precinct had walls everywhere scribbled on, litter overflowed from full baskets and lay everywhere, and already the estate was looking like a slum. The architect was not at fault, and it was difficult to see what could be done about it.

Educating Patrons

MISS ESTHER DARLINGTON referred to what had been said about the need to educate patrons today. She felt that this education should be extended to large bodies such as the LCC for though one of their departments was responsible for the building of wonderful schools, yet simultaneously other departments were ordering the demolition of the Albert Bridge, or authorising the conversion of a cleared site (purchased by them for another purpose) into an unsightly car mart. It seemed that there was no tie-up between the various departments in a body of this kind.

MR. A. HODGKINSON, head of the Art Department at Wandsworth School, a recently built LCC comprehensive school which has absorbed the existing grammar school and its affiliated technical branch, spoke of the excellent effect these magnificent buildings were having on the pupils.

MR. MARSDEN-SMEDLEY was interested in the difficult estate in Coventry to which Miss Adkins had referred. Clearly the estate ought not to have been built on such poor land, and it was for the scientists to solve the problem of how the gardens could be made fertile. The matter should be given the widest possible publicity.

POTENTIALITIES FOR LONG-SPAN PRESTRESSED CONCRETE STRUCTURES IN USA

Paper at the World Conference on Prestressed Concrete

We reproduce below a paper given by Mr. David P. Billington (of Roberts and Schaefer Co., New York) at the recent World Conference on Prestressed Concrete. Designs are presented for 180 ft. clear spans and compared in quantities and costs with a steel truss of similar span. Designs are also presented for a double cantilever construction and compared with an actual bidding (tender) for both prestressed concrete and steel design.

THE American economy has taken prestressing and developed it to its own ends. This means mass production of factory-made small units which are usually pretensioned.

Large members and longer spans which are usually post-tensioned have been less emphasised. Nothing has yet been built in the USA of a longer span than the Walnut Lane Bridge of 1949. (164 ft.). The purpose here is to show how prestressing can be applied to large-size members and long spans and still have a logical place in the American economy. This would be the custom-built market, as opposed to the mass production market of smaller members—the Lincoln Continental as opposed to the Ford.

The discussion will be limited to single bay spans and is not meant to include bridge designs. Several types of structural systems will be presented and indications given generally as to how they can be best proportioned for economical design utilising prestressing. Design techniques will not be developed, but simply referred to where they apply.

In cost comparisons, engineering estimates are used except in two cases where direct competitive bidding permitted actual contract price comparisons.

I. STRUCTURAL SYSTEMS

a. Simple Beams

The use of solid web prestressed concrete simple beams for long spans is severely restricted by the high ratio of beam dead load to total load capacity. The dead load not only requires more concrete and prestressing steel, but also complicates construction where precasting is employed, due to increased weight.

Where simple beams are used, therefore, it is all important to keep the dead load of the beams down. The most economical proportioning of the beam cross section is required. It has been pointed out[1] that this involves using a Tee section with a minimum bottom flange and web and an optimum top flange which can be determined from charts. Use of the minimum section based on total load may result in initial overstressing which can usually be overcome by two-stage prestressing. In this manner spans up to 150 ft. can be economically built with simple span beams. Up to this span the beams can usually still be precast and easily handled.

Cost studies indicate that for spans up to 100 ft. a simple beam, precast and prestressed, will be competitive with a structural steel truss. Above 100 ft. the prestressed beams will be still competitive if fire resistance and maintenance are important factors.

Three specific examples of cost comparisons will be presented to show what recent experience has been.

1. A 75 ft. span for an industrial plant was studied[2] and cost estimates revealed practically no difference in cost between a steel truss and a prestressed concrete simple beam. The concrete was chosen on the basis of appearance, permanence, and fire resistance.

2. An 80 ft. span building in the Azores was designed for the Corps of Engineers both with a structural steel truss and with a prestressed concrete beam. In competitive building the concrete was lower by about 20 per cent[3].

3. A 136 ft. span hangar has recently been completed for the Air Force at Hill AFB, Ogden, Utah[4]. Cost studies showed that a steel truss without hung ceiling would have been about 10 per cent. cheaper than prestressed concrete beams. Since this amounted to less than 1 per cent. of the entire structure, concrete was chosen on the basis of its superior fire resistance and permanence.

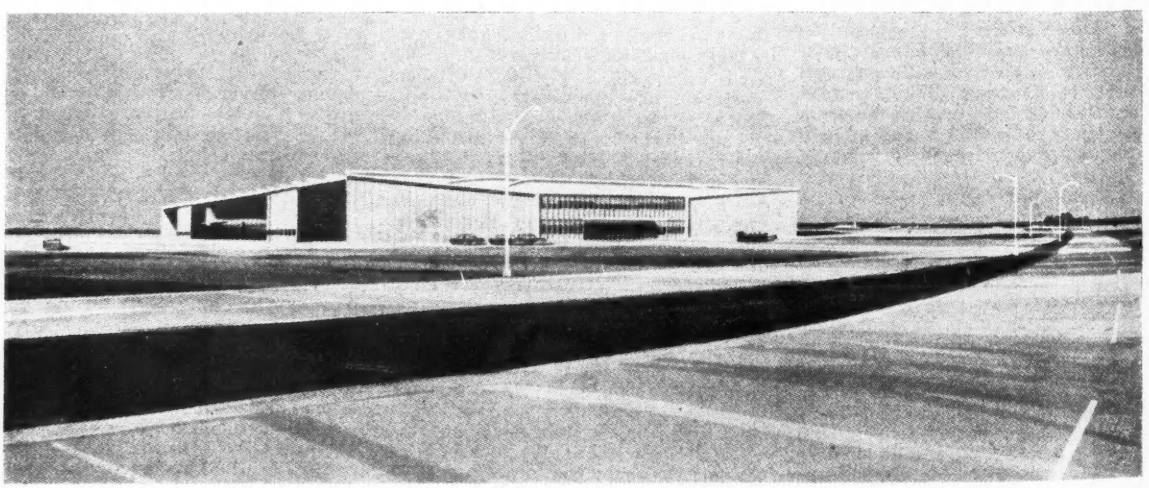
b. Rigid Frames

Rigid frames are of importance in long-span structures for several reasons. First, such structures are often subjected to large lateral loads which make some rigidity necessary. Second, the stability of long-span structures requires bracing or continuity and third, the material savings possible in frame construction often make a rigid structure more economical than a simple one.

To investigate the possibilities of such construction it is helpful to distinguish three types of prestressed concrete frames.

1. The girder is precast, prestressed as a simple beam, and connected to columns either by cast in place reinforced concrete or by a prestressing force which causes no girder rotation over the columns. A typical example of this type is the Hill AFB Hangar described above. The prestressing force does not enter into the frame analysis and this is really a simple beam design so far as prestressing is concerned.

2. The girder is precast, prestressed as a simple beam with part of the total prestressing force, erected and then prestressed with the remaining force against the column



An impression of the proposed prestressed concrete cantilever hangar (Hangar 8) for the New York International Airport

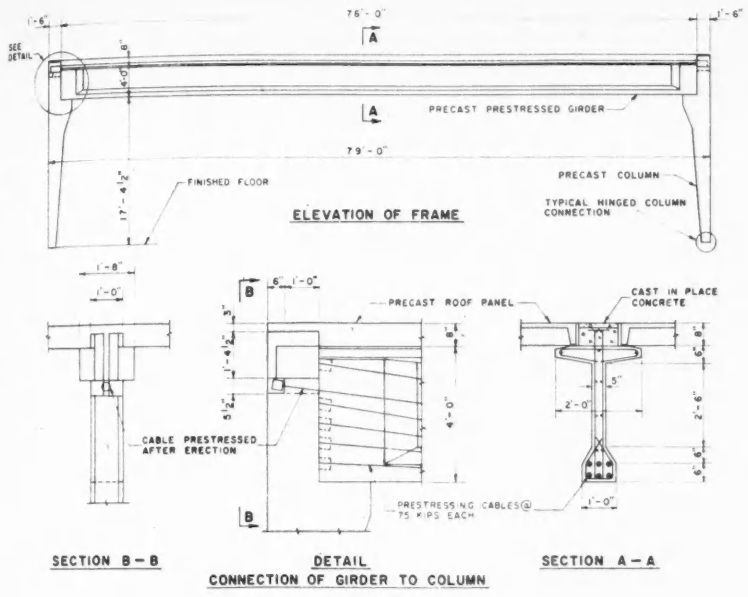


Fig. 1

to form the frame. An example of this type of frame was used in the Azores project mentioned above and is shown in Fig. 1. This type of framing provided full resistance to the high wind and earthquake forces in the area, reduced the gravity load bending moments, and still permitted full use of precasting. This partial frame prestressing would be an economical alternative to the simple beam design up to 150 ft., but above that the difficulty in precasting would usually preclude its use.

3. For the longer spans, a fully prestressed frame would usually be more economical. In this case, the entire frame is cast as one unit and all the prestressing force is applied to the structure as a frame. Detailed analyses of such systems have been presented elsewhere[5]. In essence it was shown:

First, that by prestressing only the girder of the frame, moments and shears can be induced throughout the frame in such a way as to counteract vertical load forces.

Second, that the symmetrical cross-section is the most logical for the girder in a frame; and

Third, where the prestressing force is constant over the girder length, it is of no advantage to vary the depth of the girder.

Using these general guides, a typical long span frame has been designed and is shown in Fig. 2. The plan dimensions, clearances, and loads have been chosen comparable to those of an aircraft hangar recently designed by Roberts and Schaefer Company for the Texas Company. This hangar was designed and built as a structural steel bowstring truss, shown in Fig. 3. Since the costs for this structure are known, it is of interest to compare this conventional design with the estimated costs of a similar design using prestressed concrete.

The girder is of a symmetrical I-cross-section in which the prestressing steel would be located outside the section and later covered with concrete. Placing the prestressing steel outside the section has the advantage in long span members of greatly facilitating concrete casting in webs and flanges, and also facilitating the placement of the draped tendons. This then permits the concrete cross-section to be greatly reduced in area, thereby saving in concrete, prestressing steel, and load on columns and footings. It would have been possible to choose a hollow box girder, but more concrete would have been required since the walls must have a minimum thickness for concrete placement and building safety. Also a hollow box girder presents a difficult forming problem.

In this design the prestressing tendons are draped parabolically to provide an equivalent uniform load

$$W = \frac{8Fe_c}{L^2}$$

acting upward of where:

F = prestressing force.
e_c = eccentricity of F at midspan.
L = girder span.

The frame is analysed for the uniform dead and live load, for the equivalent uniform load from prestressing, and for the effect of girder shortening due to prestressing.

Table I gives an estimated cost comparison of the rigid frame and the steel truss. Included also is a prestressed concrete truss which will be discussed below. As would be expected, the cost of the frame which has only 6 ft. of depth is greater than the steel truss which is over 20 ft. in depth at midspan. It would be perhaps more reasonable to compare a concrete rigid frame with a steel rigid frame rather than with a truss. The frame system offers advantages over the truss which are difficult to reflect in a structural cost comparison. The frame design saves over 15 per cent. of the enclosed volume of the building while maintaining the same clearances. This will result in less end wall and siding areas and perhaps a reduced heating cost. Furthermore, the main frame would be fire resistant and require no painting.

TABLE I

COMPARATIVE COSTS FOR LONG SPAN ROOF
180 ft. Span 21 ft. 9 in. Column Spacing
Cost based on Five Bays

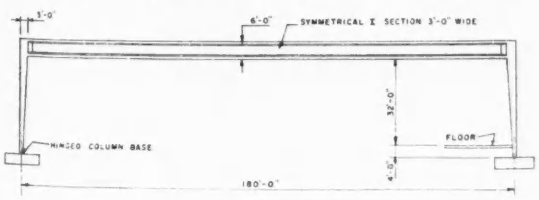
Item	Structural steel truss *	Prestressed concrete rigid frame †	Prestressed concrete truss †
Truss	39,000# steel	—	39 c.y. conc.
Girder	—	52 c.y. conc.	—
Bracing	8,200# steel	—	8,200# steel
Columns	3,900# steel	16 c.y. conc.	12 c.y. conc.
Footings	11 c.y. conc.	20 c.y. conc.	18 c.y. conc.
Total cost	$12,500.00	$14,400.00	$12,800.00
Unit cost	$3.20/s.f.	$3.70/s.f.	$ 3.28/s.f.

* Cost based on actual bid, Feb., 1956.
† Costs based on engineering estimates.

It can be seen that when full advantage of the frame prestressing is taken and when factors other than structural first cost are important, prestressed concrete frames will provide an economical solution to long-span buildings.

c. *Trusses*

Concrete trusses have never been popular in the USA. This is to a large extent due to the fact that they are more complicated both to design and construct than conventional steel trusses. This difficulty stems from the fact that whereas the steel



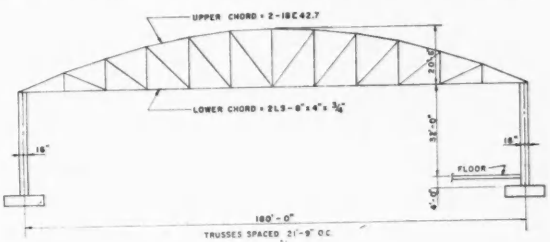


Fig. 2 (*above*).—*Prestressed concrete rigid frame.* *Fig.* 3 (*right*).—*Structural steel truss*

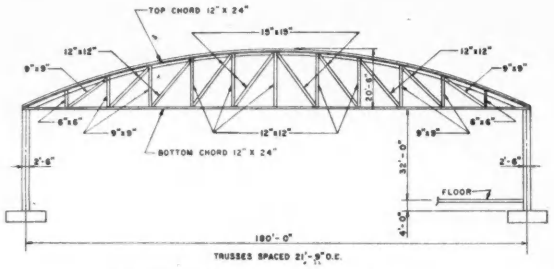


Fig. 4.—Prestressed concrete truss

truss is for all practical purposes a pinned truss, the concrete truss contains stiff members and monolithic joints which cannot act as hinges. Therefore in concrete, the so-called 'secondary stresses' become important and cause large bending moments in the truss members. Large concrete members, difficult formwork and casting, and heavy concentrations of reinforcing steel, all combine to make trusses uneconomical.

The analytical approach to the problem of secondary stresses is given by Cross and Morgan ([6]). Several points are evident. First, the secondary stresses vary directly as d/L, depth to length of any member, and are not affected greatly by changes in moment of inertia. Also secondary stresses in tension members will set up combined stresses with large tension areas. This means large amounts of steel and frequent tensile cracks.

By utilising prestressing in a concrete truss, it is possible to avoid these difficulties to a large extent. First of all, prestressing the tension members will reduce the resultant axial load to a very small value and thus permit a smaller member. Since d/L can thereby be greatly reduced the secondary stresses will also be decreased. Furthermore, the effect of prestressing the bottom chord of a truss is to deflect the truss upward. This upward movement causes secondary stress of opposite sign to those caused by the gravity loads. Finally, there will be no axial tension in top or bottom chords and with the reduced secondary stresses throughout, very little, if any, cracking will occur.

To investigate what such a prestressed truss might be like, the same 180 ft. span hangar will again be used as a design problem. The prestressed concrete truss of Fig. 4 has been designed to resist the same superimposed loads as the structural steel truss. The estimated cost of such a structure is compared to the steel truss in Table 1. It can be seen that such a system is competitive.

The design is not difficult once the designer is clear on the relation of member sizes and shapes to stresses. The major problem is one of construction. For the 180 ft. truss discussed here, it is visualised that the casting be done on the ground. The truss could be cast in several units, erected separately—much as was done with the steel truss on this hangar—and then connected together by post-tensioning the bottom chord. Connections between diagonals and top chords could be made by welding dowels and casting concrete joints. A further development of this type of construction is described in the following section on cantilever construction.

The important advantages of prestressed concrete trusses which should encourage their acceptance is that a fire resistant, maintenance free, and relatively crack-less construction can be made in concrete in cases where depth limitations are not critical and truss construction is indicated.

Furthermore, the use of long-span concrete trusses will also depend to a large extent upon construction technique of precasting and erection. It is first necessary that both the designer and builder

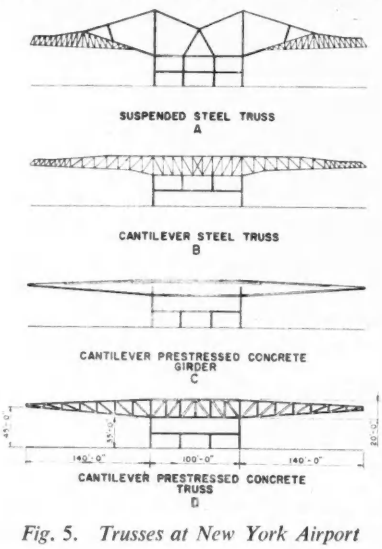


Fig. 5. Trusses at New York Airport

exploit the full potentialities of truss prestressing before its use will become practical and economical.

II. SPECIAL APPLICATIONS —CANTILEVER HANGAR

a. Prestressed Concrete Double Cantilever Girder

Cantilever construction has become popular in recent years for use in long-span aircraft hangars, in auditoriums and stadiums. A full-scale investigation of all types of cantilever construction was carried out by Roberts and Schaefer Company for the Port of New York Authority in 1949. The results of this investigation and more recent studies indicate that certain types of concrete cantilever constructions are competitive with steel cantilever trusses and suspender systems.

The basic requirements for one particular structure—Hangar # 8 for the New York International Airport—are shown in Fig. 5. The original design consisted of the suspended steel truss shown in Elevation A.

As an alternate to this design, a complete redesign was prepared utilising prestressed concrete. This is shown schematically in Elevation C of Fig. 5. A rendering of this proposed hangar design is shown on page 418. A design similar to this one is presented by T. Y. Lin in his recent book.([7])

This concrete design consisted of cast in place columns, cast in place post tensioned concrete cantilever girders, and precast concrete channel roof slabs spanning 20 ft. between girders. A cross-section of the girder is shown in Fig. 6.

The design for the 380 ft. long girder naturally required that the dead weight of the girder be as small as possible. Since the structure is statically determinate, the criteria for selecting a cross-section are similar to those for a simple beam. This means that the flange area in the zone of full load tension, top flange in this case, should be a minimum and the web thickness a minimum.

The size of the top flange was determined by the necessary space requirements for the prestressing tendons. The bottom flange area was determined mainly by ultimate load requirements.

Once the section at maximum bending had been dimensioned, the prestressing force was calculated. The depth of the girder and the amount of the prestressing force were then varied throughout the 140 ft. cantilever to give approximately the same unit stresses from support to free end. This meant that the depth went from 16 ft. to 3 ft., and the prestressing force from 3,670 kips to 790 kips.

The important problems of stability were investigated. At first glance it seemed impossible to apply a large compressive force to a 140 ft. free cantilever with a maximum width of only 4 ft., and no lateral bracing. As a column, the ACI Code allows a minimum width to length ratio of 20 which would require a girder of 7 ft. width. However, one of the particular characteristics of prestressing is that a member will not buckle under a prestressing load if the prestressing tendons are in contact with the member at enough points. Since they are continuously in contact in this girder, the buckling problem is not critical. It is important nevertheless that the compression flange be adequately braced. This bracing is supplied by the

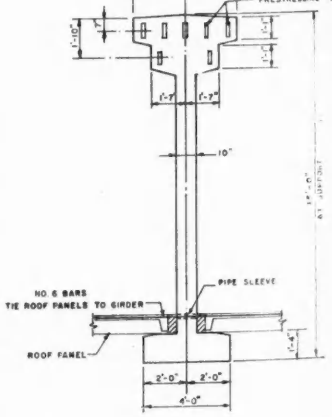


Fig. 6.—Cross-section of prestressed concrete cantilever girder

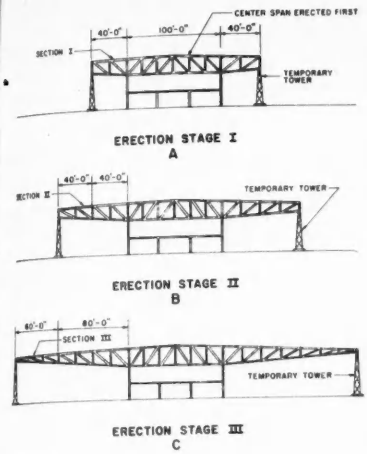


Fig. 7.—Erection of cantilever concrete truss

precast concrete roof panels which are placed on the bottom flange and connected to the girder by dowels and cast in place concrete; see Fig. 6.

Due to the unique structural system and the immense size of the forces and members, the design assumptions were purposely made well on the conservative side and the working stresses held below those commonly used in prestressed concrete design. Compressive stresses were held below $0.40f'_c$ and principal tensile stresses to $0.025f'_c$. Design stresses were based on 5,000 p.s.i. concrete, whereas the specifications called for a concrete which experience on past projects indicates will exceed 6,000 p.s.i. The ultimate load capacity was calculated to be 2.14 (DL+LL) or DL+5.6 LL. Even with this conservative approach, when the design was made in 1953, there was a good deal of scepticism as to the merits of prestressing such a large structure. Because of this doubt, certain restrictions were placed on this alternate design in prestressed concrete prior to the advertisement for bids. Most important in this regard was the requirement that one full 380 ft. girder containing 240 c.y. of concrete be built and tested to destruction by the contractor all at his own expense.

Under this handicap, the prestressed concrete design was bid competitively early in 1954 against the suspended steel truss. The results of the actual bid appear in Table II. It is noted that the cost difference between the two structures was about 8 per cent. But it should further be noted that the suspended steel truss design was rejected after reception of bids and a redesign made using a cantilever truss as shown in Fig. 5, Elevation B. This redesign added approximately $150,000 to the low steel bid price, making the difference between the two cantilever systems only 4 per cent. Furthermore, if the handicap of the test girder is removed from the comparative pricing, the difference becomes 3 per cent., which is a comparatively small percentage on a project of this size. This is particularly true considering the stage in development of prestressing in this country in 1953 and the relative conventionality of the steel cantilever design.

All of this actual cost data comparison is exceedingly important in the consideration of potentialities of long-span prestressed concrete to-day. When carefully analysed, the results of this alternate design experience, coupled with further developments in prestressed design, give an optimistic picture of prestressing possibilities if the designer has the courage to step forward and pursue them.

First, a 3 per cent. cost spread in actual bidding is not large when added advantages of reduced maintenance and increased fire resistance are considered.

Second, the reduced enclosed volume for the same clearances is an added advantage for which no credit was given on this particular project.

Finally, the requirements of performing an alternate design to a designed structure forced certain architectural features on the concrete design which could have been greatly changed had the design been made primarily on the concrete structural system. Most notable in this respect was the column spacing of 20 ft. Detailed comparative designs and cost estimates revealed that this is too close for maximum economy in the concrete structure. A spacing of 30 ft. would have given a considerable saving in cost over the design actually made.

b. Prestressed Concrete Double Cantilever Truss

A full web girder which is cast in place is surely at a disadvantage when compared to an open webbed truss fabricated in a shop and only assembled in place. If the concept of a truss is acceptable in steel there should be no reason why it could not be also applicable in prestressed concrete. It is with this belief in mind that further studies were made to determine the feasibility and economy of prestressed concrete trusses as a solution to the cantilever structure problem.

The general problems involved in prestressed concrete truss design have been presented above. The application of this design criteria to the design of the 140 ft. cantilever hangar involves no new concepts. The construction problems are, however, more imposing.

Design analyses indicate that the trusses should be 30 ft. on centres and that the total weight of a 140 ft. cantilever section would be about 200 kips. This compares to a weight of 300 kips for the full web girder described above and spaced only 20 ft. on centres. A total weight saving of over 55 per cent. is realised.

But above all in importance is the construction. It is here that the designer must really begin and it is just that the great possibilities for prestressed concrete are gradually being realised. The designer of large structures has to build them in his mind as he designs. He cannot assume that construction details will be worked out in the field. The designer becomes most like the true designer of classical mould; combining the functions of architect, engineer and builder.

In the case of the cantilever truss, one concept of construction is shown in Fig. 7. The basic planning provides for the entire truss to be precast on the ground, preferably on its side, and in a number of relatively small sections. The central 100 ft. span would be cast in one or possibly two identical pieces. This section would first be erected and connected to the two main supporting columns.

Once this central section is in place and braced, the cantilever is begun. Here the method would be generally to build outward one section at a time and connect each section back to the central span by prestressing the top chords. As shown in Fig. 7, the first cantilever section would be erected and simply supported between a temporary tower and the main column. Then the prestressing would be applied over the full 180 ft. between temporary towers, thereby tying the two 40-ft. sections to the central span. As soon as this force is applied the units marked Section 1 will act as cantilevers and the towers can be removed to a location further out. The next two sections would be erected and connected in a similar manner as shown in Elevations B and C, until the full 140 ft. has been fully connected and prestressed. Sub-framing would now be erected between the bottom chords of adjacent trusses and the roof thus completed.

TABLE II

COMPARATIVE COSTS OF CANTILEVER HANGAR SCHEMES

Elevation on Fig. 5	Structural System	Total cost	Cost without test girder
A	Suspended steel Truss *	$3,959,100	$3,959,100
B	Steel cantilever Truss *	4,110,000	4,110,000
C	Prestressed Concrete girder*	4,270,000	4,220,000
D	Prestressed Concrete truss†	4,033,000	3,983,000

* Cost based on actual bid, Feb., 1954.

† Cost based on engineering estimate.

In this general manner a structural system in concrete is provided which is equivalent to the steel cantilever truss and upon which a true reflection of competitive costs can now be made.

Table II has been extended to include an estimated cost figure for the concrete cantilever truss design. It must be remembered that the bidding prices for hangar 8 were based on 1954 costs so that the cost estimate for the concrete truss is based on the same period. If such structures were bid to-day they would surely reflect increases in costs over the past three years. The relation between the various designs should remain about the same. Possibly the prestressed concrete designs would be relatively less expensive now than three years ago due to the rapid strides of recent precasting and prestressing techniques in this country.

On the basis of this cost estimate, the concrete truss is seen to be competitive with the steel truss. The fact that the results are so close is an indication that in the

near future prestressed concrete construction will be seriously in contention for many types of long-span structures in the United States. The potentialities are there; it only remains for them to be recognised and developed.

REFERENCES

(1) Billington, D. P., 'Economical Design of Prestressed Concrete Beams,' ACI Journal, September, 1953, pp. 73-87.

(2) Billington, D. P. and Warner, M. E., 'Factory-Made Prestressed Concrete Girders Trucked 90 Miles to Site,' Civil Engineering, August, 1956, pp. 34-36.

(3) Warner, M. E. and Billington, D. P., 'Precast Concrete shows 21 per cent. Saving on Air Force Buildings,' Civil Engineering, April, 1957, pp. 33-37.

(4) 'Air Force Hangar Uses 136-ft. Precast Beams,' ACI Journal, September, 1956, News Letter pp. 7-10.

(5) Billington, D. P., 'Building Frames in Prestressed Concrete,' ACI Journal, June, 1956, pp. 1065-1081.

(6) Cross, H. and Morgan, N. D., 'Continuous Frames of Reinforced Concrete,' John Wiley and Sons, Inc., New York, 1932.

(7) Lin, T. Y., 'Design of Prestressed Concrete Structures,' John Wiley and Sons, Inc., New York, 1955, pp. 246-249.

Restrictive Covenants

EASTBOURNE PROPERTY CASES

From a Legal Correspondent

THERE have been two recent cases decided affecting property in Eastbourne where applications were made to the courts for a declaration under Section 84(2) of the Law of Property Act 1925 that land was no longer affected by restrictive covenants.

In the one case *Re Freeman Thomas Indenture Re Ratten Estate,* Mr. Justice Harman in the Chancery Division was prepared to make the necessary declaration but in the more recent case of *In re 'Blunt House' Meads-road, Eastbourne, Sussex,* the Court of Appeal reversed the decision of the Lands Tribunal and refused to accede to the application for the modification of the covenant. The distinction between the two cases does clearly indicate in what circumstances the court will allow work which contravenes the covenant.

In the Freeman Thomas case, 82 acres of a large estate were conveyed in 1901 by the tenant for life of an estate to the Eastbourne Corporation and they covenanted 'to maintain the land conveyed as a public park and for no other purpose whatsoever and that they would not erect any building on the land without the written consent of F . . .', etc. Eventually the estate known as the R. estate was broken up into small plots and there appeared to be no owner of the estate as a whole. The Corporation desired to build a grammar school and applied for a declaration under S.84 of the 1925 Act. They joined a large number of persons in the neighbourhood as respondents but none entered an appearance.

Evidence was given that the representative of F. was not interested for the time being. In these circumstances, having regard to the fact that no one had come forward and that there was no one who could enforce the covenants, the learned judge was prepared to exercise the discretion permitted by the section and declared that the land was not affected by the restrictions.

In the Blunt House case there was an application for the modification of restrictive covenants preventing the use of the house for any trade or business whatsoever or otherwise than as a private dwellinghouse. The reason for the application was that the owner had sold the premises to the Metal Box Co., Ltd., who wished to use the premises as a convalescent or rest home. The covenants had been imposed under conveyances of 1908 and 1945 and the premises were being used as a private school under a licence granted in 1951.

In giving judgment the Master of the Rolls pointed out that the covenant covered property within a half mile radius—mostly residential. Some schools had been permitted but with a clear control forbidding the playing of games on the premises. There were three objectors who had appealed against the decision of the Lands Tribunal. The court had to consider three matters in reviewing the covenant and even then the court had a discretion.

The applicants could ask for the court's discretion if they proved one of three grounds as a prerequisite, namely (1) the restrictions should be deemed obsolete (2) the continuance of the covenants would impede the reasonable use of the land by the applicants without securing any practical benefit to the objectors and (3) the discharge of restrictions would not injure persons who were entitled to benefit by these covenants. In this case the Master of the Rolls held that none of these matters had been proved.

ECE Housing Committee

DEVELOPMENT PROBLEMS REVIEWED

THE main developments in the field of housing and housing policies in 1956, reports on financing of housing and future work on an inquiry into utilisation of space in dwellings were the principal topics discussed at the 14th session of the United Nations Economic Commission for Europe's Housing Committee. The Committee met from May 29-31.

The discussion on the main developments in housing, which also included certain long-term problems of current interest arising in connection with government housing policies, was based on a provisional report, prepared by the Secretariat on 'European Housing Trends and Policies in 1956.' [The revised version of the report was reviewed in *The Builder* of August 23, page 329]. In addition to the general review of the housing situation, the publication will include chapters on methodology of formulating house-building programmes and on housing management.

Financing

Following presentation of a number of rapporteurs' reports on financing of housing, delegates concentrated their attention on the economic and financial problems of housing, the position of housing in the overall financial framework, current sources of capital, private financial institutions concerned with housing and housing subsidies. A full provisional version of an overall report will be prepared by the Secretariat with the help of rapporteurs for discussion by the Housing Committee at its next session in November, 1957.

The rapporteurs on utilisation of space in dwellings have prepared an inquiry to governments inviting them to submit plans of typical dwellings in selected categories recently built in urban and rural areas, together with a statement setting out particulars on standards prescribed for low-cost housing and current regulations or codes governing ceiling heights and certain facilities and equipment. A provisional overall report by rapporteurs is expected by the 1958 spring session of the Housing Committee.

Standardisation

The committee discussed a report by the Secretariat on the present state of work on standardisation and modular co-ordination and heard a review of the work being done in this field by the European Productivity Agency, the International Standards Organisation and the International Council of Building. In view of the importance of intergovernmental co-operation on this phase of housing, both from the point of view of reducing building costs and of developing trade in building materials and components, the committee decided that an *ad hoc* meeting under its auspices should be held as soon as possible. The meeting will consider what action can be taken by governments to promote and accelerate the application in practice of standardisation and modular co-ordination and examine its impact on trade in building materials and components.

In the course of the session the committee noted the reports of the Working Party on Housing and Building Statistics and took note of two working papers summarising the state of work on concepts and definitions. Following the session, a number of participants in the committee spent a week in Austria studying housing and building techniques, at the invitation of the Austrian Government.

Mr. Bonnome (France) and Mr. Cervenka (Czechoslovakia) were respectively elected chairman and vice-chairman of the Housing Committee.

Builders' Clerks' Report

The Builders' Clerks' Benevolent Institution have issued their 'Ninetieth Annual Report' from their offices at 47, Bedford-square, WC1. Included are the rules of the institution and lists of subscribers.

Timber Career Booklet

A booklet entitled 'The Timber Trade as a Career' has been published by the Timber Trade Federation of the United Kingdom with a view to arousing the interest of school leavers in a career in this field. At the same time this well illustrated booklet provides information of use and interest to their parents and teachers. Copies from the Federation at 75, Cannon-street, EC4.

Nationalised Building?

OPERATIVES' RESOLUTION EXAMINED

From a Labour Correspondent

RECENT statements from the Labour Party regarding public control and ownership do not include the building or building materials industries. Indeed, on the face of it, there would seem to be some attempt to wean opinion away from the concept of outright nationalisation towards state participation in a wide range of the nation's economy. But these are arguments, not decisions; only the Party annual conference can define in broad principle the shape of proposed legislation for the next Labour Government. The forthcoming meeting at Brighton may or may not accept the dish which is being offered.

The building trade unions, at any rate, have not altered their views. These were crystallised in the form of a resolution at the 1949 (Porthcawl) conference of the National Federation of Building Trades Operatives (although, since the turn of the century they have pinned their faith somewhat vaguely on eventual public ownership). The text of the resolution said: 'That this annual conference, believing that previous conference resolutions on the nationalisation of the building industry should be further considered, instructs the Executive Committee to prepare a scheme for at least the first stage of public control, including the setting up of a National Building Corporation, and to report its recommendations to the next annual conference.'

At that point the idea ceased to be merely a useful horse to ride at the rostrum, to the accompaniment of emotional cheers from the rodeo spectators, and it was entered into the ledger of practical politics. The necessity for hard thinking on ways and means brought the twin questions of land and materials before the Executive Committee. In its report to the 1950 (Ayr) annual conference it produced the first sketch plan for nationalisation around which a major debate fluctuated. The plan envisaged the take-over, under a National Building Corporation, of all contracting firms over a certain size, the dimensions to be measured by either the number of men employed, or the amount of annual turnover. If the former, it was suggested that over 20 operatives would qualify for admission, whilst if the latter, then the sum of £100,000 would be the limit before take-over.

The Land Problem

On the land problem the report said: 'We think it right to say that we are not too happy about nationalising the building industry while leaving the land in private hands . . . we regard the common ownership of land as essential to the success of the nationalisation of the building industry.' There was a similar bold and uncompromising approach to building materials and distribution . . .' it seems to us a useless procedure for the state to take over the handling of materials so vital to an industry if the manufacture and distribution of those materials remains in private hands. The handling of materials and their construction into buildings are but a link—the final link—in the chain of a complete job. . . .'

This last was buttressed by the argument that materials were already fully monopolised and that, therefore, their take-over would be relatively easy. At that time the Simon Report was a fairly new publication (1948) and doubtless had some effect in formulating views on this point. This official inquiry (into the distribution of materials) had burrowed deep and had actually said . . . 'Our examination of the field has revealed no industry producing building materials or components in which we can state with confidence that there is free competition in prices.'

Going into figures, the NFBTO scheme said that roughly 1,000,000 men would be involved in the change—excluding those employed in the manufacture and distribution of materials—and that existing labour forces employed direct by local authorities and private firms such as ICI and Courtaulds would be best left alone. It would be necessary to create an entirely new state department—to be called the Ministry of Building—of which the National Building Corporation would be the . . . 'body concerned with the immediate day-to-day tasks.'

Basis of Compensation

The Ayr debate produced a few objections to the main thesis, but all the points made were collated and a further report was submitted the following year at Cleethorpes (1951). The scheme, of course, provided for compensation and eschewed any tendency towards syndicalism. . . . 'The operatives will not themselves own the industry.' Compensation was to be for loss of profit of a limited period of years—not loss of capital, and workers' participation was to be on lines consistent with the declared principles of Labour Party policy.

In this way the NFBTO codified its proposals and rendered the whole business explicit. The affiliated unions were equipped with a plan and a set of arguments which they could employ in their representation at Labour Party conferences (the Federation as such has no representation) and this, in fact, was done.

After the 1951 defeat of the Labour Government the question became more than a little academic. There was obviously no immediate prospect of implementation and the wooing of the politicians, stripped of office, lost some of its ardent urgency. Now, however, with the distinct possibility of an electoral swing to the left, there has been a dusting of furniture and the plan is being brought forward as practical politics. To further this a pamphlet has been produced which outlines the scheme in readable terms and is aimed primarily at the building operative so as to marshal the maximum support within the industry itself.

This latest publication, 'Building as a Public Service,' is uninhibited in its robust assertion that nationalisation is a more efficient method than private enterprise. It importunes readers not to be . . .' scared of the much-abused term "planned," for remember that capitalism plans . . . what is really wrong is that with the present set-up the industry is badly planned. Competition is said to be its motive force and yet the competitive element is avoided wherever possible.'

Monopolies

The Monopolies Commission's comments on the London Builders' Conference are invoked as evidence that the free market is not relished by the contractors—no more than is the position with building materials. Here, it is baldly stated, . . . 'every building material is in the hands of a monopoly—cement, bricks, paint, glass, timber, in fact the whole lot. These monopolies, whose costs of production are kept a strict secret, are completely outside any kind of public control or surveillance.'

On compensation it suggests that firms coming within the take-over be given, for five consecutive years, a sum equivalent to their average profits for the five preceding years—less 20 per cent. The new National Building Corporation would . . . 'eliminate the present excessively wasteful tendering system and instal in its place the method of fixed prices.'

The least that can be said for all this is that it is nothing if not ambitious. Some £2,000m. per annum is involved and this is approximately 20 per cent. of the national income: if carried into effect it would be the largest operation of its kind ever attempted.

So much then for the genesis and background of the conception. The representatives of over one million operatives have embraced a policy of gigantic proportions and, unless we assume they are merely rattling sabres, it says much for their courage. They now have to persuade and condition the minds of the politicians that their plans are realistic and capable of application. As has been said, this is another matter; particularly in view of the 'new look' which is being canvassed by the intelligentsia of the Labour Party. It is an open secret that certain sectors of opinion are now regarding outright nationalisation as 'old fashioned' and that the way forward lies in a liaison between state and private enterprise—a kind of companionate marriage. If this view prevails then the chances of the NFBTO scheme are slender.

Conversely, the spiritual force of the Labour movement with its fundamental precept of 'production for use, not profit,' may still be cogent enough to resist the trimmers and in that case nationalisation of building in the foreseeable future is a distinct possibility. Time will tell. Meanwhile, the NFBTO is under instructions to propagate the principle of public ownership and to continue its studies of the issues involved.

At all events, there is more to this affair than the mere momentum of the past.

Many of the present leaders of the operatives are relatively young men and have therefore no personal memories of the syndicalist and guild movements; they have more than once declared that they have been driven to this course by the failure of the employing side of the industry to face up to the reforms which are needed. These include decasualisation, the fully guaranteed week, massive technical research, and the establishment of sensible finance.

Basically, then, their proposals are an admission of a lack of confidence in the future of an industry with its present organisational set-up and they are pitting their strength against the existing amorphous giant which, in their view, can never meet their stipulated desiderata for a viable and progressive industry.

MAKING AN INCOME SECURE

Advantage of Continuous Disability Insurance

From a Correspondent

THE professional man as a matter of course makes sure that his house and its contents are adequately insured. He usually makes provision for the education of his children and for his family in the event of his premature death, with a pension for himself on retirement.

All this provision depends entirely on his ability to continue at work and so earn an income. In the event of disablement how long will his income continue? Probably for a limited period only, after which the plans of a lifetime may have to be abandoned and savings gradually depleted. Good health is the basis of present achievement and future progress. It is simple commonsense to make certain that illness or accident does not endanger the plans and prospects of the professional man and his family.

Continuous disability insurance secures an income as no other safeguard can. Like a life assurance policy (and unlike policies which are issued for 12 months only on the annual contract basis) the insurance company cannot decline to renew the policy prior to the normal expiry date—usually age 65. No matter how many claims are made the cover provided under the policy cannot be restricted nor can the premium be varied.

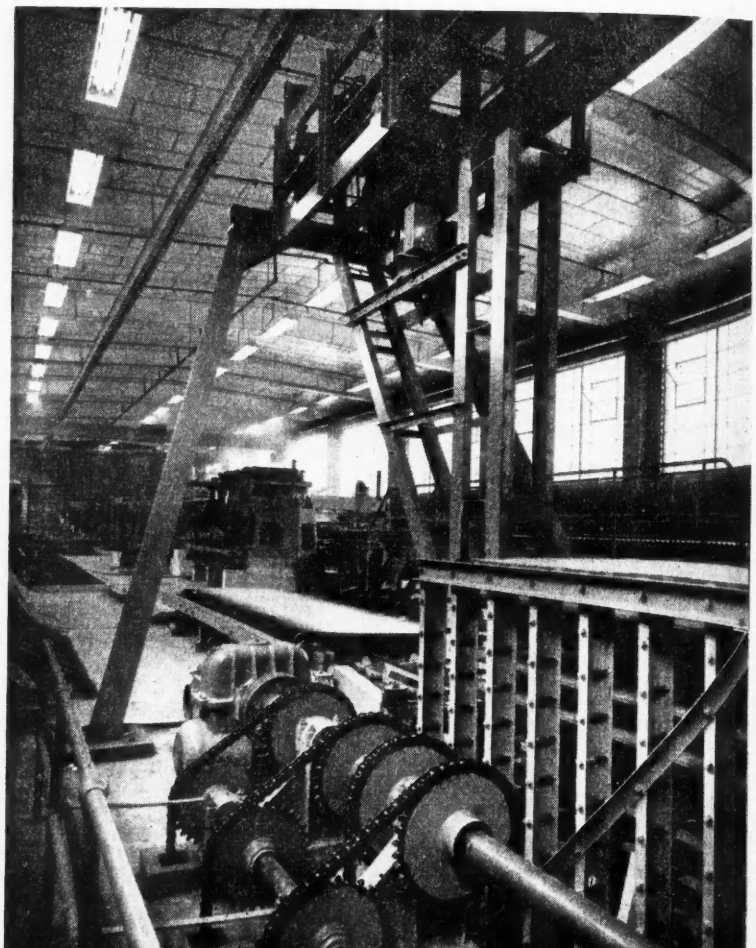
Some Actual Cases

The income secured by such a policy is payable so long as disablement continues up to the pre-selected date for the expiry of the contract. The records of the ABS Insurance Agency, Ltd., show cases where incomes have been paid to a policy holder for more than 20 years without a break—including cases of epilepsy, tuberculosis, paralysis, poliomelitis, mental disorder—though when his policy was taken up each claimant was in good health.

With such cases in mind the weakness of a year-to-year policy with its limit of 104 weeks' benefit stands out clearly. While it is only too true that a continuous disability policy can neither entirely remove nor ward off illness and accident, it can give that freedom from anxiety which is so much to be desired and so helpful in the time of disablement.

This is not a new class of insurance: it has been transacted since 1885 and policies are being issued on an ever-increasing scale to men engaged in professional and business activities. An admirable feature of the scheme is that it is subject to periodical actuarial investigation in a similar way to life assurance. It thus stands on an unassailable scientific basis, while the accumulated funds under such a scheme provide the necessary reserve for the substantial liabilities involved.

The premiums payable are not high. A policy can be arranged to provide benefits from the first day of disablement: lower rates of premium are allowed where benefits begin after disablement has lasted one month or three months. Such policies would cover serious illness or accident, while the exclusion of short periods of disablement reduces substantially the rate of premium payable. The ABS Insurance Agency, Ltd., has made arrangements whereby attractive terms are offered to architects taking up policies under this unique but well tried scheme. Inquiries addressed to the agency at 78, Wimpole-street, London, W1, will have prompt and careful attention.



NEW HARDBOARD PLANT.—What is described as one of the most modern and versatile hardboard plants in the world was opened recently at the North Circular Road factory of Celotex, Ltd. Costing more than a million pounds, this factory will more than double the total output of hardboard. The architect was Mr. Eric Firmin, FRIBA, and the builders, Trollope & Colls, Ltd. Output of the new factory will range from $\frac{1}{10}$ in. thick to $\frac{5}{16}$ in. thick boards; some of the eleven different types of board will be manufactured specially to meet export market conditions

CHAINS AND LIFTING GEAR

Talk at Safety Centre

MR. W. R. HOCKADAY, BSc, MINA, HM Deputy Senior Engineering Inspector of Factories, spoke on chains and other lifting gear at a meeting of the London Building and Engineering Contractors Accident Prevention Group, held recently, at the Safety Centre, SW1.

In his opening remarks, Mr. Hockaday referred to the many British Standards concerned with lifting gear, e.g., Standards for various types of chain, chain slings, links, hooks, shackles, etc. 'There is no doubt' he said, 'that the article of lifting tackle which we most commonly use in our factories is ordinary link chain. Since the war, more and more electrically welded steel chain has been used, but it is of utmost importance that steel shall not be used as an admixture, otherwise it will not be possible to make a good weld. Manganese content is also important.' He went on to point out the wisdom of not merely ordering 'Short link wrought iron chain' but ordering chain and other gear which complies with the appropriate British Standard.

Dealing with BS590, 'Electrically welded MS Chain,' the speaker explained how this was made by a process known as rimming which caused a rim of pure material to form round a core of impure material. 'In practice,' he said, 'this can mean that the chain maker will have the unenviable task of attempting to weld simultaneously two dissimilar metals.' But in actual practice an abnormal number of failures of this chain had not come to his notice.

Referring to BS781—'Wrought Iron Chain Slings,' he said 'You will be pleased to know that a British Standard applicable to higher tensile steel chain is in course of preparation.' He put forward a plea for the adoption of links alternative to rings, since the same portion of an alternative link would always be on the chain hook, thus eliminating the possibility of weld failures due to alternation of stress.

A New British Standard

Mr. Hockaday gave a further warning. 'Be sure that the SWL of any sling ring, or alternative link, is at least equal to the sum of the safe working loads of the legs attached to it. When ordering slings, make sure their rings will accept the hooks of the cranes they will be working with.' He went on to quote Regulation 60, dealing with prevention of displacement of the sling or load from the hook, and referred to a new British Standard to be issued shortly entitled 'Higher Tensile Steel Hooks.' Eyebolts without collars should not be subjected to inclined pulls. Some people will have noticed how dramatically the SWL of an eyebolt decreases as the angle of application of the pull increases!

On the subject of fibre ropes, Mr. Hockaday explained how more and more sisal rope had come into use—owing to wartime restriction on the use of manila ropes to lifeboats' falls. Sisal rope had a tendency to stiffen when wet but if the user purchased what was known as BS Water Repellent sisal rope (or a rope having equally satisfactory properties) they would find this disadvantage had been overcome.

Care was especially necessary when using fibre ropes—and when storing them. Manila and sisal ropes which had been exposed to corrosive fumes or substances were lethal. 'When stored,' he added, 'fibre ropes should be protected from damp and heat. Do not leave them on wet ground—moulds and germs will rot the rope. Beware of rats in the store!'

In conclusion, Mr. Hockaday said: 'I am certain that if our desired object of preventing accidents due to the use of lifting gear is to be attained, it is vital that such work be adequately supervised, that we use only suitable, sound, well maintained gear; that we think before we leap; and finally we do not, as the saying is, "chance our arm."'

EXCAVATIONS AT JERICHO

Discourse at the Royal Institution

EXCAVATIONS at Jericho was the subject of a discourse by MISS KATHLEEN KENYON, CBE, MA, DLitt, given recently at the Royal Institution. Organised by the British School of Archaeology in Jerusalem at Jericho, in the Hashemite Kingdom of Jordan, excavations have now been in progress over a period of six years, under the direction of Miss Kenyon, who is Director of the school.

The excavations of 1957, which were on a small scale, and for a shorter time than usual, she said, had recently been completed. This year, attention was mainly directed to the very earliest levels on the site. Jericho had produced evidence of a hitherto unsuspected early development towards civilisation, and in the past five years considerable areas have been excavated of a town of about eight acres in area, of well-built houses defended by a massive stone wall. The Carbon-14 method of dating had shown that this town was as early as *c.*6,000 BC.

In 1956, the excavations showed that this town was preceded by a yet earlier one, of which the defences consisted of a rock-cut ditch, and a great stone wall, backed by a massive solid stone tower, in the heart of which was a finely-built staircase. The 1957 excavations were concerned with the houses of this earlier town. They were found to be solidly built of mud-brick, and to be unlike the later ones in that they were circular in plan, and slightly sunk below the exterior surface.

The earliest levels had not yet been reached, but one of the remarkable results of the 1957 excavations was to show that the earlier houses were even more substantial than the later ones. One of the houses, by no means the earliest found, could now be dated to *c.*6,800 BC. That highly organised settlements such as these should exist at such an early date was completely revolutionary to previous ideas of the beginnings of civilisation.

WATERTOWER CONSTRUCTION IN SWEDEN

Novel Method Used

AN interesting new method of construction has been specially devised for the watertower of the Central-Swedish city of Orebro, it is reported from Stockholm. The water tank, which contains nearly 300,000 cu. ft. of water and weighs 3,200 tons empty—12,000 tons filled—is shaped like a wide funnel or inverted cone, having a diameter of 145 ft. at the top. It was built on the ground and raised to the top of its central supporting column, 100 ft. high, by means of 32 hydraulic jacks. The hoisting job has recently been completed.

The exceptional design of the new watertower was necessitated by the fact that the most suitable location was a small hill in the centre of a growing housing district. Both from an aesthetic point of view and so as to avoid heavy shadows over the apartment houses it had to be given its unconventional shape. The great width of the funnel and the total height of the construction would have made ordinary scaffolding very expensive if the tank had to be built on to the column. There might also have been danger of vertical displacement, with extra stress on the water-supporting walls.

AB Vattenbyggnadsbyran (VBB), whose engineers designed the watertower, sublet the concrete construction to AB Svenska Stenbeläggningar, who devised the method of lifting the tank by means of hydraulic power. In collaboration with Domkraft AB Nike, of Eskilstuna, who supplied the jacks, this firm evolved the further details of the job, although outside scientific advice was also called in. Among the problems to be solved in advance was that of attaining absolutely perpendicular hoisting. Another was that of strengthening the construction against heavy winds.

Sliding Moulds

The supporting column was built by means of sliding moulds, ascending successively as the funnel rose from the ground. After each 4 in. lift a light-metal disc of that height was inserted below each jack. Each pile of three discs was subsequently replaced by a reinforced massive concrete cylinder, which was then built into the concrete wall of the supporting column. At a rate of about two such cylinders per day the tank rose by 2 ft. daily, so that the whole procedure lasted about two-and-a-half months.

So as to ensure absolutely perpendicular motion, the lifting was done by hand. First, 29 machine-operated jacks out of the total number of 32 took about 3,000 tons of the load off the supporting foundation, whereupon three men with manually operated jacks slowly eased the remaining load upwards. Special instruments were used to check the vertical correctness of the ascent.

The tower, which is being given a white surface, is a most striking landmark in Orebro. On top of the tank there will be an outlook platform, possibly later housing a terrace restaurant as well. Two lifts for ten passengers each inside the central column will take the visitors to the top. The Orebro TV and VHF stations are also to be located on top of the tank, their radio masts adding another 50 ft. to the height.

The Builder

CURRENT PRICES OF MATERIALS

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchant's warehouse will necessarily be higher so as to include the stocking and handling costs involved. Due to the exceptional circumstances now prevailing it is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

	£	s.	d.
Pit Ballast ... ... per yd.	1	7	1
Pit Sand ... ... ,,	1	4	6
Washed Sand ... ... ,,	1	7	8
¾ in. Shingle ... ... ,,	1	4	0
½ in. Broken Brick ... ... ,,	1	0	9
Pan Breeze ... ... ,,		10	9
Fine or Coarse Foamed Slag Aggregate ... ... per ton	3	5	0

2 yds. of fine and 2.6 yds. of coarse per ton.

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

Best British Portland Cement. Standard Specification delivered Charing Cross area.			
6-ton loads and upwards, site ... ... per ton	5	12	0
1 to 6 tons, site ... ... ,,	6	4	0
Rapid Hardening Cement in 6-ton loads and upwards to site ... ... ,,	6	2	6
1 to 6 tons do. site ... ... ,,	6	14	6
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.			
Sulphate Resisting Cement. 32s. 6d. per ton on ordinary cement prices.			
Red, Buff or Khaki Colorcrete in 6-ton lots ... ,,	8	12	0
Other colours according to colour.			
In 4-ton lots from 310s. 0d. to 780s. 0d. per ton.			
White Portland Cement ... ... ,,	13	17	6
Under 1 ton ... ... per cwt.		16	11
417 Cement (Ultra Rapid Hardening) in 6-ton lots and upwards ... ... per ton	7	4	6
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.			
Cullamix Tyrolean Finish, £11 10s. 0d. to £14 5s. 0d. (1-ton loads and upwards).			
Lightning and Ciment Fondu Brands High Aluminous cement, 6-ton lots and up ... ... ,,	15	14	6
Stourbridge Fireclay, 6-ton loads at Railway Depot, London ... ... ,,	6	17	6
Moler Mortar Powder for Flue Bricks (London sites) ... ... per cwt.	1	10	0

BRICKS

Full Loads.

First Hard Stocks ... ... per 1,000	13	14	6
Second Hard Stocks ... ... ,,	12	13	6
Mild Stocks (Kiln Burnt) ... ... ,,	9	4	0
Mild Stocks ... ... ,,	8	19	0

All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.

2½in. Nominal Fletton Bricks to sites in W.C. District Commons ... ... ,,	5	18	0
Cellular do. ... ... ,,	5	18	0
Keyed do. ... ... ,,	6	0	0
Rustics ... ... ,,	7	10	0
Cellular Rustics ... ... ,,	7	10	0
Single Bullnose Commons ... ... ,,	7	12	6
Sandfaced ... ... ,,	8	10	0
Tuscans ... ... ,,	9	5	0
Saxons ... ... ,,	9	13	0
Golden Buffs ... ... ,,	10	0	0
Dapple Light ... ... ,,	10	7	6
Best Blue Pressed Staffs (London Stations) ... ,,	29	15	6
,, Bullnose (London Stations) ... ... ,,	30	9	6
Blue Wire Cuts (London Stations) ... ... ,,	26	15	6
Midhurst Lime Bricks (London sites) ... ... ,,	10	15	6
Uxbridge Whites (London sites) ... ... ,,	10	2	0
Special Purpose Sandlime Bricks (London sites) ... ,,	7	18	6
2½ in. Best Stourbridge Fire Bricks (London Stations) ... ... ,,	29	9	9
3 in. do. (London Stations) ... ... ,,	35	7	9
2½ in. Moler Flue Bricks (London sites) ... ... ,,	36	0	0
2½ in. Machine-made Sandfaced Red Facings (London sites) ... ... ,,	15	18	6
2½ in. Machine-made Multi Red Facings (London sites) ... ... ,,	16	3	6
2½ in. Hand-made Sandfaced Red Facings (London sites) ... ... ,,	15	18	6
2⅝ in. Hand-made Sandfaced Multi-Colour Facings (London sites) ... ... per 1,000	16	13	6
Hand-made Sandfaced Cherry Red Facings, Berkshire district (London sites) ... ... ,,	18	14	0
Hand-made Sandfaced Multi-Colour Facings. Berkshire district (London sites) ... ... ,,	18	14	0
Rubber Bricks for gauged arches (London sites) ... ,,	42	17	6
2⅝ in. Surrey Clamp Burnt Multi Stock Facings (London sites) ... ... ,,	14	4	0
2⅝ in. Surrey Kiln Burnt Multi Stock Facings (London sites) ... ... ,,	15	16	0
Glazed Bricks (London sites), White, Ivory, Brown—			
Stretchers ... ... ,,	64	0	0
Headers ... ... ,,	63	0	0
Quoins, Bullnose and 4½ in. Flats ... ... ,,	80	0	0
Double Stretchers ... ... ,,	85	0	0
Double Headers ... ... ,,	77	10	0
One side and two ends ... ... ,,	87	0	0
Two sides and one end ... ... ,,	89	10	0
Splays and Squints ... ... ,,	83	0	0

Cream and Buff £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 32½% for Best quality and plus 32½% less 10% for Second quality.

PARTITION SLABS, etc.

Delivered Central London Area. (W.C. District.)

HOLLOW CLAY PARTITION BLOCKS (Keyed)

	Minimum lorry loads			
*2 in.	140 yds.	per yd. sup.	4	5
*2½ in.	140 yds.	,,	4	8
*3 in. (3 cavity) ...	120 yds.	,,	5	5

BUILDING BLOCKS (Keyed)

*3 in. (6 cavity) ...	110 yds.	,,	5	7
*4 in. (6 cavity) ...	95 yds.	,,	6	10
6 in. (8½ in. × 5⅝ in.)	1,250 blocks	per 1,000	26	18 0

*Half blocks at no extra charge.

CLINKER CONCRETE

2 in.	100 yds.	per yd. sup.	3	9
2½ in.	85 yds.	,,	4	4
3 in.	75 yds.	,,	5	3
4 in.	55 yds.	,,	6	5

CRANHAM

2 in.	... ...	,,	6	9
2½ in.	... ...	,,	7	5
3 in.	... ...	,,	8	9
4 in.	... ...	,,	10	9
4½ in. Load bearing quality	... ...	,,	11	10

MOLER PARTITION BLOCKS

2 in.	150 yds.	,,	15	0
2½ in.	120 yds.	,,	15	6
3 in.	100 yds.	,,	16	0
4 in.	90 yds.	,,	19	0

LIGHTWEIGHT CONCRETE BUILDING AND PARTITION BLOCKS OF VARIOUS SOURCES OF MANUFACTURE

2 in.	100 yds.	,,	5	10
2½ in.	80 yds.	,,	7	0
3 in.	65 yds.	,,	8	2
4 in.	50 yds.	,,	9	8
4½ in.	44 yds.	,,	10	4
6 in.	33 yds.	,,	13	10½

THERMALITE-YTONG PARTITION BLOCKS

2½ in.	144 yds.	,,	7	0

THERMALITE-YTONG LOADBEARING INSULATING BLOCKS

3 in.	120 yds.	,,	8	5
4 in.	90 yds.	,,	11	0
5 in.	72 yds.	,,	13	9
6 in.	60 yds.	,,	16	6
8½ in.	42 yds.	,,	1	3 8

FLOOR BLOCKS AND FILLER TILES

3 in. Floor Blocks 12 in. by 12 in. delivered in full lorry-loads ... ... per 1,000	34	1	0	
4 in. do ... ... ,,	36	10	0	
5 in. do. ... ... ,,	43	15	0	
6 in. do. ... ... ,,	49	19	0	
7 in. do. ... ... ,,	61	8	0	
8 in. do. ... ... ,,	71	19	0	
12" × 3" × ⅝" Filler Tiles in multiples of 10 tiles per 1,000 multiples	42	15	0	
12" × 4" × ⅝" do. do.	73	15	0	

STONEWARE DRAIN PIPES, etc.

The following are the percentages to be added to the Revised Standard List (Nov., 1956) prices delivered London Area.

Delivered ex Merchants Wharf or Depot or Manufacturers Works.

	Over 2 tons	Over 100 pieces Under 2 tons	Under 100 pieces Under 2 tons
Best Quality ...	−2½%	+15%	+22½%
BSS Best do. ...	+10%−2½%	+10% +15%	+10% +22½%
Tested Quality ...	+37½%−2½%	+37½%+15%	+37½%+22½%
BSS Tested do.	+47½%−2½%	+47½%+15%	+47½%+22½%

STONEWARE DRAIN PIPES, etc.—*continued*

	£	s.	d.
3 in. Land Drain Pipes (in 12 in. lengths) ... per 1,000	11	10	6
4 in. do. ... ... ,,	15	3	6
6 in. do. ... ... ,,	31	9	0
9 in. do. ... ... ,,	59	13	0

DAMP COURSE

Hessian base bitumen 7 lb. per yd. sup. in 24 ft. rolls cut to wall widths in lots of £6 value and over delivered London area ... ... per yd. sup.		3	5½
Asbestos base ditto 7 lb. per yd. sup. do. do. ,,		5	3
Lead lined bitumen ditto 9½ lb. per yd. sup. do. ,,		12	2
18 in. × 9 in. British damp course slates ... ... per 1,000	43	8	11
14 in. × 9 in. do. do. ... ... ,,	32	8	2
9 in. × 9 in. do. do. ... ... ,,	18	18	9
18 in. × 4½ in. do. do. ... ... ,,	19	19	9
14 in. × 4½ in. do. do. ... ... ,,	15	18	3
9 in. × 4½ in. do. do. ... ... ,,	10	14	3

STONE

Bath Stone—			
Monks Park ... ... per ft. cube		9	4
St. Aldhelm Box Ground ... ... ,,		10	7
Delivered in railway trucks at South Lambeth B.R. Western Region.			
Doulting Stone Random Blocks. Delivered London area ,,		9	2
Beer Stone. Delivered London area ... ... ,,		8	9
Portland Stone—			
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region ... ... ,,		8	8
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.			
9 in. × 3 in. Rubbed, weathered, throated and stooled cills ... ... per ft. cube	4	1	9
12 in. × 6 in. do. do. ... ... ,,	2	18	3
12 in. × 3 in. Plain coping, twice throated ... ,,	2	5	3
12 in. × 3 in. Weathered and twice throated coping ,,	3	0	3
14 in. × 6 in. do. do. ... ... ,,	2	14	3
4½ in. × 9 in. Plinth rubbed on top and face ... ,,	2	8	6
3 in. sawn two sides Slabs, random sizes ... ... per ft. sup.		8	8
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ... per ft. cube	1	9	9
do. do. fair one edge for fair faced brickwork ... ... ,,	1	15	3
Hard York—			
12 in. × 2 in. Square Steps, rubbed on top and edge per ft. run		10	6
14 in. × 3 in. Round-nosed Steps, rubbed on top and front ... ... per ft. cube	2	15	6
12 in. × 6 in. Plain Steps, rubbed top and front ,,	2	8	6
2 in. Rubbed and Jointed Paving, given sizes ... per ft. sup.		9	9
2 in. Sawn Paving, edges squared, in random sizes per yd. sup.	3	8	6

TILES AND PANTILES

Delivered London area by road in 6 tons or over per 1,000			
Machine-made Pantiles and French pattern Tiles from Lincolnshire district	29	19	0
Hand-made Pantiles Berkshire district	55	18	0
Hand-made Double Roman Bridgwater district	60	11	6
Hand-made 10½ × 6½ tiles Berkshire district	15	9	0
Machine-made 10½ × 6½ Staffordshire district	14	13	6
Hand-made Hip and Valley tiles per doz.	1	11	3
Machine-made Hip and Valley tiles do.	1	9	6
Concrete tiles 10½ × 6½	8	10	0
do. Interlocking (49S)	19	16	6

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.			
24 × 12	143	15	10
22 × 12	116	17	4
22 × 11	105	10	10
20 × 12	99	0	1
20 × 10	94	16	9
18 × 10	65	16	9
18 × 9	57	14	0
16 × 10	51	17	0
16 × 8	40	11	9

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

Softwood—					
Joinery quality	Ex Wharf		per standard	£115 to £140	
Carcassing quality	do.		,,	£97 to £102	
1 in. Tongued and Grooved Flooring	do.		,,	£110	0 0
Hardwood—					
Mahogany—African S.E.	do.		per ft. cube	1	10 0
do. Honduras do.	do.		,,	3	5 0
Oak European do.	do.		,,	2	5 0
do. Japanese do.	do.		,,	2	10 0
do. English Logs sawn	do.		,,	2	0 0
Teak 8 in. average S.E.	do.		,,	3	17 6
Walnut African Logs sawn	do.		,,	1	5 0

DOORS (in Lots 1-11)

	£	s.	d.
Delivered London area			
1½ in. 4 Horizontal Panel. Pattern 4 in. deal			
2 ft. 0 in. × 6 ft. 6 in. ... ... each	1	16	0
2 ft. 3 in. × 6 ft. 6 in. ... ... ,,	1	17	6
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	1	18	6
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2	0	6
2 in. do. but top panel open. Pattern 4 × G in deal			
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	2	9	0
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2	11	6
2 in. 2 Panel top panel open. Pattern 2 × G in deal			
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	2	3	0
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2	5	0

SUNDRIES

Delivered London area.			
1 in. Wood Wool Slabs 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton) ... ... per yd.		6	2
1½ in. do. (67 yds. to 1 ton) ... ... ,,		8	0
2 in. do. (52 yds. to 1 ton) ... ... ,,		9	9½
2½ in. do. (45 yds. to 1 ton) ... ... ,,		11	3
3 in. do. (39 yds. to 1 ton) ... ... ,,		12	7½
Quantities under 1 ton add 1d. per ½ in. of thickness.			
½ in. imported insulation Board, quantities over 5,000 sq. ft. per 100 sq. ft.	2	2	6
⅛ in. Hardboard do. ... ... ,,	2	1	6
⅜ in. do. do. ... ... ,,	3	2	6
1/16 in. Asbestos Flat Building Sheets ... ... per yd. sup.		4	3
¼ in. do. ... ... ,,		5	9½
Roofing Felt 1-ply ... ... ,,		1	9
do. 2-ply ... ... ,,		2	2½
Best Scotch Glue in slabs ... ... per ½ cwt.	5	0	0
do. pearl ... ... ,,	5	5	0
Croid Glue ... ... 28 lb.	2	6	0
Cut Nails 3 in. (1-ton. lots) ... ... per ton	73	0	0
do. 4 in. and up (1-ton lots) ... ... ,,	69	10	0
Wire Nails 3 in. (4-cwt. lots) ... ... per cwt.	3	13	11
do. 4 in. and up (4-cwt. lots) ... ... ,,	3	13	3

METALS

STEEL JOISTS, ETC.

Basis Joists—			
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in., 12 in. × 6 in. plain cut to lengths delivered London area ... ... per ton	51	2	6
Extra for sizes			
3 in. × 1½ in. 4 in. × 1½ in. ... ... ,,	3	10	0
3 in. × 3 in. ... ... ,,	2	10	0
4 in. × 3 in. ... ... ,,	2	5	0
10 in. × 4½ in. ... ... ,,	1	10	0
5 in. × 2½ in. 5 in. × 3 in. ... ... ,,	1	15	0
4½ in. × 1½ in. ... ... ,,	3	5	0
5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. ,,		15	0
6 in. × 3 in. 24 in. × 7½ in. ... ... ,,	2	0	0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in. ,,	1	5	0
9 in. × 4 in. 10 in. × 5 in.			
12 in. × 5 in. 22 in. × 7 in. ... ... ,,	1	0	0
9 in. × 7 in. 10 in. × 8 in. 12 in. × 8 in.			
14 in. × 5½ in. 14 in. × 6 in. 14 in. × 8 in.			
15 in. × 5 in. 15 in. × 6 in. 16 in. × 6 in. ,,		10	0
16 in. × 8 in. 18 in. × 6 in. 18 in. × 7 in.			
18 in. × 8 in. 20 in. × 6½ in. 20 in. × 7½ in.			
Steel angles average price ... ... ,,	53	2	6
Steel tees average price ... ... ,,	54	2	6
Fabricated work delivered London—			
R.S. Joists cut and fitted ... ... ,,	70	12	6
Compound girders ... ... ,,	77	0	0
Stanchions ... ... ,,	82	10	0
Compound stanchions ... ... ,,	87	0	0
In Roof Work—Trusses and Purlins ... ... ,,	100	12	6
Average prices not for awkward work.			
Angle cleats and ⅝ in., ¾ in. and ⅞ in. bolts average price London area ... ... per cwt.	5	19	0

FERRO-CONCRETE BARS

Mild Steel Ferro-Concrete bars British manufacture to BSS785 ex London Stock ⅝ in. diam., and upwards ... ... per ton	49	17	6
¼ in. diam. ... ... ,, extra	8	12	6
5/16 in. do. ... ... ,,	6	12	6
⅜ in. do. ... ... ,,	4	12	6
½ in. do. ... ... ,,	3	2	6

MILD STEEL TUBES

Tubes to BSS1387 and Fittings. List prices and following discounts :

Galvanised Tube—	Under 1 ton	Over 1 ton	W.I. Fittings	Malleable Fittings
Class A	+24½%	+21½%	Light +48%	Malleable List
Class B	+37½%	+34½%	Heavy +55½%	−20½%+40%
Class C	+57½%	+54¼%		
Black—				
Class A	+ 4½%	+ 1½%	Light +35½%	Malleable List
Class B	+18¼%	+15 %	Heavy +43¼%	− 20½%
Class C	+34½%	+31¼%		

C.I. HALF-ROUND GUTTERS

Delivered London per yd. in 6-ft. lengths

	Gutters	Nozzles	Stop Ends
3 in.	4 0½	3/7	1/–
3½ in.	4/4½	3/11	1/–
4 in.	5/8	4/5	1/7
4½ in.	6/3	4/11	1/10
5 in.	6/11½	5/4	2/2

METALS—*continued*

C.I.O.G. Gutters

	Gutters	Nozzle	Stop Ends
3 in.	5/2½	4/8	1/3
3½ in.	5/10	4/8	1/7
4 in.	6/5	4/11	1/10
4½ in.	6/11½	5/8	2/2
5 in.	7/7½	6/5	2/6

C.I. Rain-water Pipes

Per yd. in 6-ft. lengths	Pipe	Bends	Branches
2 in.	8/7½	4/5	6/4
2½ in.	8/7½	4/11	8/6
3 in.	9/8½	6/2	9/2
3½ in.	11/0½	7/3	11/–
4 in.	12/9	8/9	13/1

L.C.C. Coated Soil Pipes

2 in.	9/8½	7/7	9/2
2½ in.	10/4	8/5	11/5
3 in.	11/7	9/2	13/7
3½ in.	12/11½	11/5	15/10
4 in.	14/9	12/9	18/8

Above prices for gutters, rain-water and soil pipes for under 5 cwt. lots only. Lots over 5 cwt. see List No. 3300 dated February 1, 1955, plus 22½% and tonnage allowance. 4-ton lots 5 per cent., 2-ton lots 2½ per cent.

L.C.C. Coated Drain Pipes

In 9-fts.

	cwt.	qt.	lb.	per yd.	Bends	Branches
4 in.	1	1	17	33/6	23/3	41/3
6 in.	2	0	1	49/2	62/–	99/–

Asbestos Rain-water Pipes and Fittings

All less 17½ per cent. discount.

		2 in.	2½ in.	3 in.	4 in.
Pipes 6-ft. lengths	per yd.	4/3	4/6½	5/6	7/3½
Shoes	each	2/9	3/–	3/7	4/10
Single Branches	,,	4/4	5/1	6/1	8/6
Bends square or obtuse	,,	3/–	3/4	4/4	6/1
Swan Necks 4½ in. proj.	,,	3/4	4/4	4/10	6/9
,, 6 in. ,,	,,	3/7	4/4	5/5	7/3

Asbestos O.G. Gutters and Fittings

		4 in.	4½ in.	5 in.	6 in.
Gutters 6 ft. lengths	per yd.	4/1	4/5½	5/4	6/4½
Drop ends	each	3/3	3/9	4/5	5/2
Stop ends	,,	1/–	1/1	1/2	1/4
Angles	,,	3/4	3/10	4/8	5/5
Nozzles	,,	3/3	3/9	4/5	5/2
Union Clips	,,	1/7	1/11	2/4	2/8

Asbestos Half-Round Gutters and Fittings

		3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters 6 ft. lengths...	per yd.	2/10	3/4½	3/5½	4/1	5/8
Drop ends	each	2/4	2/9	3/–	3/4	4/10
Stop ends	,,	–/11	1/–	1/1	1/2	1/4
Angles	,,	2/8	3/–	3/4	3/7	4/10
Nozzles	,,	2/4	2/9	3/–	3/4	4/10
Union Clips	,,	1/2	1/3	1/4	1/6	2/3

	Per ton basis in London £ s. d.
Iron—Staffordshire Crown Merchant Quality	49 7 6
Mild Steel Bars	47 12 6
Mild Steel Hoops	44 2 6

	Ex Merchant's Stock per ton Two-ton lots £ s. d.
Soft Sheets C.R. and C.A.—	
20 gauge	62 14 6
24 gauge	65 4 6
26 gauge	68 4 6
Galvanised Corrugated sheets 6 ft. to 9 ft.—	
20 gauge	71 12 0
24 gauge	75 2 0
26 gauge	80 7 0
Galvanised flat sheets C.R. and C.A.—	
20 gauge	73 2 0
24 gauge	76 12 0
26 gauge	81 17 0

ALUMINIUM AND ALUMINIUM ALLOYS

(Base prices)		£ s. d.
Sheet BS 1740 S1C 18 SWG (36 in. wide)	per lb.	2 11
Sheet BS 1470 NS3 Utility 18 SWG (36 in. wide)	,,	2 8½
Coiled strip BS 1470 S1C 18 SWG (24 in. wide)	,,	2 10
Coiled strip BS 1470 NS 3 Utility 18 SWG (24 in. wide)	,,	2 8
Coiled strip for flashing 99.7% purity 22 SWG (12 in. wide)	,,	3 0½
Corrugated sheet BS 1470 NS 3 Utility Circular Profile 8 ft. × 32 in. × 20 SWG	per sheet	1 12 6
Corrugated sheet BS 1470 NS 3 Utility Industrial Profile 8 ft. × 31½ in. × 20 SWG.	,,	1 18 1
Corrugated sheet BS 1470 NS 3 Utility Mansard Profile 8 ft. × 31½ in. × 20 SWG	,,	1 11 7
Extruded section BS 1476 E1C simple moulding	per lb.	2 9
Extruded section BS 1476 E1C 1 in. diam. round	,,	2 6½
Extruded section BS 1476 HE1WP simple angle	,,	3 0
Extruded section BS 1476 HE10WP 1 in. diam. round	,,	2 11
Tubing BS 1471 T1C 1½ in. O/D × 20 SWG	,,	4 4½
Tubing BS 1471 HT10WP 1½ in. O/D × SWG	,,	5 8

PLUMBERS' BRASS WORK, etc.

Delivered in London area.

M.O.H. All per doz.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown bib cocks Crutch head for iron	87/–	128/8				
Toilet bib cocks for iron	109/–	158/5				
Screwdown stop cocks for iron	66/–	95/9	188/–	363/–	522/6	917/6
do. with two unions for lead	89/–	132/–	234/4	472/–	623/6	1389/6
Double nut boiler screws	18/8	26/5	47/6	48/6	67/–	93/6
Heavy Croydon ball valves	77/–	193/6	312/5	568/8	734/10	—
Plumbers' union brass lead to iron	19/6	23/6	38/6	52/10	70/6	165/–
	1½ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
Caps and screws	33/–	40/8	59/6	92/5	118/10	155/3
Brass sleeves		31/11	31/11	56/2	74/10	91/5
	1½×6 lb.		1½×6 lb.	2×7 lb.	3×7 lb.	
Lead P. trap with brass cleaning screws	68/6		85/6	137/–		234/–
Lead S. trap do.	83/–		102/6	168/3		302/–

Solder		s. d.
Plumbers'	1 cwt. lots	332/– 14 lb. lots per lb. 3 6
Tinmen's	,, ,,	408/– ,, ,, 4 1
Blow pipe	,, ,,	411/– ,, ,, 4 3

Copper Tubes and Sheets

Copper tubes BSS 659/1944 on the basic price of 23¾d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 3 cwt.

	Extra d.		d.		d.
¼ in. × 19 gauge	14¾	Total per lb.	38½	approx per ft.	10½
¾ in. × 19 ,,	13	,, ,,	36½	,, ,,	14½
1 in. × 18 ,,	11½	,, ,,	35½	,, ,,	22½
1¼ in. × 18 ,,	10½	,, ,,	34½	,, ,,	26½
1½ in. × 18 ,,	10½	,, ,,	34½	,, ,,	31½
2 in. × 17 ,,	12½	,, ,,	36½	,, ,,	50½

Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras ... ... per ton £246 0 0

Zinc

			£ s. d.
Sheet Zinc	10 gauge (25 SWG)	5 cwt. lots upwards per cwt.	7 7 0
do.	12 gauge (23 SWG)	,, ,,	7 5 9
do.	14 gauge (21 SWG)	,, ,,	7 4 6

Brass Tubes

Brass tubes basic price, plus gauge and manufacturing extras ... ... per lb. 1 7¾

LEAD SHEET AND PIPES

Basis selling price in minimum one-ton delivery to one address in London or Home Counties.

		£ s. d.
Lead Sheet, English, 3½ lb. substance and upwards	per ton	130 5 0
Lead Water Pipe in coils	,,	132 10 0
Lead Soil Pipe 10 ft. or over 2 in. to 4 in. dia.	,,	134 0 0
,, over 4 in. dia.	,,	136 0 0
Lead Gas or Untinned Compo pipe	,,	134 0 0
Extras over Basis for quantities under 1 ton		
5 cwt. and under 1 ton	per cwt.	2 0
3 cwt. do. 5 cwt.	,,	4 0
1 cwt. do. 3 cwt.	,,	6 0

Smaller quantities than 1 cwt. priced specially.

Supplying sheet lead and lead pipe to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.

Allowance for Old Lead, collected £80 15s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

				£ s. d.
Coarse Pink in 1-ton loads and over	Delivered on Site		per ton	8 9 6
do. White	do.	do.	,,	8 19 0
Siripite Coarse	do.	do.	,,	8 10 6
do. Fine	do.	do.	,,	8 18 6
Blue Lias Lime in 6-ton loads			,,	6 14 6
Hydrated Lime (Grey)	do.		,,	5 17 6
do. (White)	do.		,,	6 5 0
Lump Lime (Grey)	do.		,,	5 7 0
do. (White)	do.		,,	5 14 6
White Keen's or Parian Cement in 1-ton loads			,,	12 4 6
Pink Keen's or Parian Cement in 1-ton loads			,,	11 19 3
Granite Chips in 6-ton loads			,,	2 8 6
Hair			per cwt.	4 17 6
Gypsum Plaster Lath or Base Board ⅜ in. thick 600 yds. and over in one delivery. Delivered site			per yd.	2 5
1,200 yds.			,,	2 4
Do. Insulating do. ⅜ in. thick 600 yds. and over in one delivery. Delivered site			,,	3 0
1,200 yds.			,,	2 11½
Gypsum Plaster Wall Boards, 3 and 4 ft. wide, 6 to 12 ft., ⅜ in. thick, 600 yds. and over in one delivery Delivered site			,,	2 8
1,200 yds.			,,	2 7
Do. Insulating do. ⅜ in. thick 600 yds. and over in one delivery. Delivered site			,,	3 3
1,200 yds.			,,	3 2½

PAINT AND DISTEMPER

		£	s.	d.
Delivered London area				
Ceiling Distemper	per cwt.	1	7	6
Washable Distemper	per cwt.	5	5	0
Gloss Paint	per gal.	2	12	0
Snowcem cement paint (in 1 cwt. drums)	per cwt.	3	11	0
LEAD PRODUCTS AND OILS				
Ground White Lead, in 1 cwt. kegs	per cwt.	8	18	3
Genuine White Lead Paint, 1-19 gal. lots in 1 gal. tins	per gal.	3	9	6
Genuine Red Lead, Dry, 1 cwt. keg.	per cwt.	6	9	6
Genuine Linseed Oil Putty, 1 cwt. keg	"	2	14	0
Size XD quality 28 lb.	per tin		9	0
Raw Linseed Oil (5 gal.) drums extra	per gal.		18	6
Boiled Linseed Oil (5 gal.) do.	"		19	0
SUNDRIES				
Turpentine substitute (5 gal.) drums extra	"		5	3½
do. do. (40 gal.) do. do.	"		4	7½
Solignum, Brown (5 gal. cans) Exterior	"		8	4
Creosote (40 gal. barrels)	"		2	3
Paste Powder (1 lb. packets)	per lb.		1	10
White Lining Paper	per piece		1	2½

VARNISHES, etc.

		£	s.	d.
Delivered London area				
Oak Varnish, Outside or Inside	per gal.	2	0	0
Oak Pale Copal do.	"	2	0	0
Hard Drying Oak for Inside	"	2	5	0
Crystal Paper Varnish do.	"	2	8	0
Eggshell Flat Varnish do.	"	2	6	0
Finest Carriage Varnish	"	2	7	0
Front Door Varnish	"	2	4	0
Japan Gold Size	"	1	18	0
Black Japan	"	1	16	0
Brunswick Black	"	1	12	0
Berlin Black	"	1	10	0
Terebene	"	1	17	0
Knotting (1 gal. bottles free)	"	2	8	0
French and Brush Polish (do.)	"	2	2	0

GLASS

Delivered London area	per ft. super s.	d.
18 oz. Sheet Glass Ordinary Glazing Quality-Cut Sizes		7⅞
24 oz. " " " " " "		10⅜
26 oz. " " " " " "	1	0½
32 oz. " " " " " "	1	4½
⅛ in. Rolled Plate		11¾
⅜ in. Rolled and Rough Cast	1	3
¼ in. " " " "	1	3¾

	per ft. super s.	d.
⅛ in. Figured Rolled and Cathedral, Standard patterns : White Group 1		11½
do. Group 2	1	3⅜
do. Standard Tints	1	10
do. Special Tints	6	8
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating Group 3	1	4½
¼ in. Wired Cast	1	7½
¼ in. Georgian Wired Cast	1	7½
Hollow Glass Blocks—		Each
P.B.2. 5¾ × 5¾ × 3⅞ in.		3 3
P.B.3 7¾ × 7¾ × 3⅞ in.		5 0
P.B.32 7¾ × 7¾ × 3⅞ in.		5 0
Radiused Corner Blocks to match up with—		
P.B.2		6 0
P.B.3		7 6
P.B.32		7 6
¼ in. Polished Plate Glass, G.G. Quality—		Per ft. super
In plates not exceeding 2 ft. sup.		3 10
" " " 5 ft. sup.		4 9
" " " 45 ft. sup.		5 7
" " " 100 ft. sup.		6 0
¼ in. Polished Plate, extra sizes, *i.e.*, plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality—Not exceeding 135 ft. sup. or 250 in. one way or 135 in. both ways		9 0
Not exceeding 180 ft. sup. or ditto		12 1
Plates exceeding 180 ft. sup. prices on application.		
Substances other than ¼ in. Polished Plate at Special Prices.		

Quantity Tariff—Sheet and Sundry Glass.

The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass	Minimum quantity	Per ft. sup. s.	d.
18 oz. sheet O.Q.	3,000		5⅝
24 oz. " "	2,000		7⅞
26 oz. " "	2,000		9¼
32 oz. " "	2,000	1	1½
⅛ in. Rolled Plate	1,000		8⅜
⅛ in. Figured Rolled and Cathedral Standard Patterns, White Group 1	1,000		8⅜
do. Group 2	1,000		10½
⅛ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte Group 3	1,000		11⅞
5/16 in. and ¼ in. Rolled Plate or Rough Cast	2,000	1	0
¼ in. Wired Cast, Hexagonal	2,000	1	2
¼ in. Georgian Wired Cast	2,000	1	2¼

The Builder

CURRENT RATES OF WAGES

AS FROM MAY 27, 1957. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors.)

KEY TO SCHEDULE OF GRADE RATES.

Grade Classification.	A	A1
Craftsmen	4/6	4/5½
Labourers	3/11½	3/11

Town.	*Grade.*
Aberavon	A
Aberdare	A
Abergavenny	A
Abingdon	A1
Accrington	A
Addlestone	A
Afan Valley	A
Aldeburgh	A1
Aldershot District	A1
Alfreton UD	A
Alnwick UD	A
Altrincham	A
Amble	A
Ambleside	A1
Amersham	A1
Ammanford	A
Andover	A1
Anglesey, Isle of	A1
Ardingly	A1
Arundel	A1
Ascot	A1
Ashbourne RD	A1
Ashbourne UD	A1
Ashby-de-la-Zouch UD	A
Ashby Woulds UD	A
Ashford (Kent)	A1
Ashford (Middlesex)	A
Ashington UD	A
Ashtead	A
Ashton-under-Lyne	A
Aspatria and Brayton	A1
Atherstone RD	A
Attleborough	A1
Axminster	A1
Aylesbury	A1
Aylsham	A1
Bagshot	A1
Bakewell UD	A1
Banbury	A1
Bangor	A1
Barnard Castle UD	A
Barnoldswick UD	A
Barnsley CB	A
Barnstaple	A1
Barrow-in-Furness	A
Barrow-upon-Soar RD (part Thrussington)	A1
Barry	A
Basford RD (exc. Willough-by-on-the-Wolds A1)	A
Basingstoke	A1
Bath	A
Batley MB	A
Baxterley	A1
Beaconsfield District	A
Bearl	A
Beccles	A1
Bedale RD	A
Bedford	A
Bedlington	A
Bedlingtonshire UD	A
Bedwas	A
Beeston & Stapleford UD	A
Belper UD	A
Belton	A
Berkhamsted	A
Berrington	A1
Berwick Borough	A
Beverley MB	A
Bewdley MB	A
Bexhill-on-Sea	A1
Bideford	A1
Biggleswade	A1
Billericay	A
Billing	A
Billingham UD	A
Bilsthorpe	A
Bilston MB	A
Birchington	A1
Birkenhead	*
Birmingham CB	†A
Bishop Auckland UD	A
Bishop's Stortford	A
Bishops Castle MB	A1
Bispham	A
Blackburn	A
Blackpool	A
Blackwell RD	A
Blandford	A1
Blaydon UD	A
Blidworth	A
Blyth B.	A
Bodmin	A1
Bognor Regis	A1
Boldon UD	A
Bolsover UD	A
Bolton	A
Boston MB	A
Bourne End	A
Bournemouth District	A
Brackley MB	A1
Bracknell	A1
Bradford CB	A
Bradford-on-Avon	A1
Braintree	A1
Brandon & Byshottles UD	A
Brecon—Borough of	A1
Breconshire, County of	‡A1
Brent Knoll	A1
Brentwood	A
Bridgend	A
Bridlington MB	A
Bridlington RD	A1
Bridgnorth MB	A1
Bridgnorth RD	A1
Bridgwater	A1
Brierfield	A
Brighouse MB	A
Brighton & Hove	A
Bristol District	A
Broadstairs	A1
Bromsgrove UD	A
Broughton, Flint	A
Buckfastleigh	A1
Buckingham	A1
Buckley	A
Bungay	A1
Burnham-on-Crouch	A1
Burnham-on-Sea	A1
Burnley	A
Burton-on-Trent C.B.	A
Bury	A
Bury St. Edmunds	A1
Buxton	A
Byfleet	A1
Caernarvon	A1
Caernarvonshire, Cnty. of	‡A1
Calder Valley	A
Camberley District	A1
Cambridge	A
Cannock UD	A
Canterbury	A1
Cardiff	A
Cardiganshire, County of	‡A1
Carlisle	A

CURRENT RATES OF WAGES—Continued

Town.	Grade.
Carlton UD	A
Carmarthen—Borough of...	A1
Carmarthenshire,Cnty of ‡	A1
Carnforth	A
Castleford UD	A
Caterham	A
Chapel-en-le-Frith	A
Chard	A1
Charmy Down	A
Chatham District	A
Chatteris	A1
Cheadle (Staffs) RD	A
Chelmsford	A
Cheltenham	A
Chepstow	A
Chertsey	A
Chester	A
Chester-le-Street UD	A
Chesterfield MB	A
Chesterfield RD	A
Chichester	A1
Chipping Norton	A1
Chipping Sodbury	A1
Chippenham (inc. Chippenham Within and Hardenhuish)	A1
Chorley	A
Cirencester	A1
Clacton	A1
Clay Cross UD	A
Cleethorpes MB	A
Clevedon	A1
Cleveleys	A
Clitheroe	A
Coalville UD	A
Cobham (Surrey)	A
Colchester	A
Colne	A
Colwyn Bay	A1
Congleton	A1
Consett UD	A
Conway	A1
Corby UD	A
Cornwall, County of	‡A1
Corsham District	A
Coventry CB	A
Cranbrook	A1
Cranleigh	A1
Cranwell Aerodrome Site	A
Crawley	A1
Crewe	A
Crewkerne	A1
Cromer	A1
Crook and Willington UD	A
Crowborough	A1
Cuckfield	A1
Cwmbran	A
Dalton-in-Furness	A
Darlington CB	A
Dartmouth	A1
Darwen	A
Daventry MB	A1
Deal	A1
Denbigh Town	A1
Derby CB	A
Devizes	A1
Devon, County of	‡A1
Dewsbury CB	A
Didcot	A1
Diss	A1
Doncaster CB	A
Dorchester	A1
Dorking	A
Dorset, County of	A1
Dover	A1
Dovercourt	A
Driffield UD	A1
Drigg & Carleton	A
Droitwich MB	A
Dudley CB	A
Dunstable	A
Durham B	A
Eastbourne	A
E. Glam. & Mon. Val.	A
East Grinstead District	A1
East Kesteven RD	A1
East Retford MB	A
Eastwood (Notts) UD	A
Ebbw Vale & District	A
Edenbridge	A1
Ely	A1
Epping	A
Evesham MB	A1
Exeter	A
Exmouth	A1
Fakenham	A1
Falmouth	A1
Fareham	A
Faversham	A1
Felixstowe	A1
Filey UD	A
Fleetwood	A
Flint MB	A
Folkestone	A1
Frinton	A1
Frome	A1
Gainsborough UD	A
Gateshead CB	A
Gillingham (Dorset)	A1
Gillingham (Kent)	A
Glastonbury & Street	A1
Glossop	A
Gloucester	A
Gloucestershire, Cnty. of ‡	A1
Godalming	A1
Goole, MB	A
Goole RD (part—Airmyn, Hook)	A
Gosport	A
Grantham MB	A
Gravesend	A
Grays Thurrock UD Area	A
Great Yarmouth	A
Grimsby CB	A
Grimsby RD (part)	A1
Guildford District	A1
Halesowen MB	A
Halifax CB	A
Halstead	A1
Haresfield	A1
Harlow	A
Harpenden	A
Harrogate MB	A
Hartlepool B	A
Harwell	A1
Harwich	A
Haslemere	A1
Hastings	A1
Hatfield (Herts)	A
Havant	A
Haywards Heath	A1
Heanor UD	A
Hemel Hempstead	A
Henley-on-Thames	A1
Hereford	A1
Herefordshire, Cnty. of	‡A1
Herne Bay	A1
Hertford	A
Hexham RD	A
Hexham UD	A
Heysham	A
Heywood	A
Higham Ferrers MB	A
High Wycombe	A
Hinckley UD	A
Hitchin	A
Hoddesdon	A
Holywell	A
Horley	A1
Horncastle UD	A1
Horsham	A1
Horwich	A
Huddersfield CB	A
Hull	A
Hunstanton	A1
Huntington (Staffs)	A
Ilfracombe	A1
Ilkeston MB	A
Ilkley UD	A
Ipswich	A
Isle of Sheppey	A1
Isle of Thanet	A1
Isle of Wight	A1
Jarrow B	A
Keighley MB	A
Kendal	A
Kenilworth UD	A
Kettering MB	A
Keynsham	A
Kidderminster MB	A
Kingskerswell	A1
King's Lynn	A1
Kingsteignton	A1
Kirkham	A
Knaresborough UD	A
Knutsford	A
Lancaster	A
Leamington MB	A
Leatherhead	A
Leeds CB	A
Leek UD	A
Leicester CB	A
Leighton Buzzard	A1
Leiston	A1
Leominster	A1
Letchworth	A
Lewes	A1
Lichfield MB	A
Lincoln CB	A
Liskeard	A1
Littlehampton	A1
Liverpool	*
Llandudno	A1
Llanelly (incl. Llanelly RD)	A
Llanfairfechan	A1
Llangollen	A1
London	*
Long Eaton	A
Looe	A1
Loughborough MB	A
Louth MB	A1
Lowestoft	A
Loxton	A1
Ludlow MB	A1
Ludlow RD	A1
Luton	A
Lyme Regis	A1
Lyneham (Devon)	A1
Lytham	A
Macclesfield	A
Maidenhead	A
Maidstone	A
Maldon (Essex)	A1
Maltby UD	A
Malton UD	A1
Malvern UD	A1
Manchester	A
Manningtree	A1
Mansfield MB	A
March	A1
Margate	A1
Market Harborough RD	A1
Market Harborough UD	A
Market Rasen UD	A1
Martock	A1
Maryport	A
Matlock UD	A
Melksham	A1
Melton Mowbray UD	A1
Merionethshire	A1
Merthyr	A
Mexborough UD	A
Middlesbrough CB	A
Middleton	A
Middlewich	A
Mildenhall	A1
Milford Haven UD	A1
Minehead	A1
Monmouth—Borough of	A1
Monmouthshire	A1
Morecambe	A
Moreton Valence	A1
Morley	A
Morpeth B	A
Morpeth RD	A
Mundesley	A1
Nantwich	A
Neath & Valley	A
Nelson	A
Newark MB	A
Newbury	A1
Newcastle-on-Tyne CB	A
Newcastle-under-Lyme	A
New Forest District	A1
Newmarket	A1
Newport, Mon.	A
Newport Pagnell	A1
Newquay	A1
Newton Abbot	A
Normanton UD	A
Northallerton District	A
Northallerton UD	A
Northampton CB	A
North Shields	A
North Walsham	A1
Northwich	A
Norton Radstock	A1
Norwich	A
Nottingham CB	A
Nuneaton MB	A
Oakham RD	A1
Oakham UD	A1
Okehampton	A1
Oldham	A
Ongar	A
Ormskirk	A
Ossett & Horbury	A
Oswestry	A1
Oundle UD	A1
Oxford	A
Oxted	A1
Padstow	A1
Paignton	A1
Par	A1
Pembrokeshire (except Milford Haven)	A1
Penmaenmawr	A1
Penrith UD	A1
Penzance	A1
Peterborough, Soke of (Eastern Regional portion)	A1
Petersfield	A1
Pickering	A1
Plymouth	A
Pontefract MB	A
Pontypool & District	A
Pontypridd District	A
Porthcawl	A
Portishead	A
Portland Bill	A1
Portsmouth	A
Port Talbot	A
Preston	A
Princetown	A1
Pudsey MB	A
Pulborough	A1
Radnorshire, County of	‡A1
Ramsgate	A1
Raunds UD	A
Rayleigh	A
Reading	A
Redcar B	A
Redditch UD	A
Redhill & Reigate	A
Rhondda Valley	A
Richmond B (Yorks)	A
Ripon MB	A1
Rochdale	A
Rochester	A
Ross-on-Wye	A1
Rossendale Valley	A
Rotherham CB	A
Royston	A1
Rugby MB	A
Rugeley UD	A1
Rushden UD	A
Saffron Walden	A1
St. Albans	A
St. Austell	A1
St. Helens	A
St. Neots	A1
Salisbury City	A1
Salisbury Plain	A1
Sandy	A1
Sawbridgeworth	A
Saxmundham	A1
Scarborough MB	A
Scunthorpe MB	A
Seaford & Newhaven	A1
Selby UD	A
Sevenoaks	A
Shaftesbury	A1
Sheerness	A1
Sheffield MB	A
Shepton Mallet	A1
Sherborne	A1
Shipley	A
Shoeburyness	A
Shoreham	A
Shrewsbury MB	A
Sirhowy Valleys	A
Sittingbourne	A1
Skegness UD	A1
Skipton UD	A
Sleaford UD	A1
Slough, Windsor & Eton District	A
Smethwick CB	†A
Snettisham	A1
Solihull UD	A
Somerset, County of	‡A1
Southampton and Eastleigh	A
Southend-on-Sea Dist.	A
Southport	A
South Shields CB	A
Southwold	A1
Spalding UD	A1
Stafford MB	A
Staines	A
Stamford MB	A1
Stantonwick	A
Stevenage	A
Stockport	A
Stockton RD	A
Stockton-on-Tees B.	A
Stoke-on-Trent CB	A
Stoke Orchard	A1
Stourbridge MB	A
Stourport UD	A
Stowmarket	A1
Stratford-on-Avon MB.	A
Stroud (RD Area)	A1
Sunderland CB	A
Sunningdale	A1
Sutton Coldfield MB	A
Swadlincote UD	A
Swaffham	A
Swanage District	A1
Swansea	A
Swindon District	A
Swinton UD	A
Tamworth MB	A
Taunton	A1
Tavistock	A1
Tenterden	A1
Teignmouth	A1
Tewkesbury	A1
Thames Haven	A
Thetford	A1
Thirsk RD	A
Thorpe Bay	A
Thurrock UDC Area	A
„ North of to Billericay	A
Tilbury	A
Todmorden MB	A
Tonbridge	A1
Torquay	A1
Totnes	A1
Tring	A1
Trowbridge	A1
Truro	A1
Tunbridge Wells	A1
Tynemouth CB	A
Ulverston	A
Uppingham (Salop)	A1
Uttoxeter RD	A1
Uttoxeter UD	A1
Wakefield CB	A
Wakefield RD	A
Walsall CB	A
Wallsend B	A
Walsden	A
Walton-on-Naze	A1
Ware	A
Warminster	A1
Warrington	A
Warwick MB	A
Wednesbury MB	A
Wellingborough UD	A
Wellington UD	A
Wellington (Somerset)	A1
Wells (Norfolk)	A1
Wells (Somerset)	A1
Welwyn	A
Welwyn Gar. City	A
West Bromwich CB	A
Westbury	A1
Westcliff-on-Sea	A
Westerham	A1
West Hartlepool CB	A
Westmorland (except Kendal)	A1
Weston-super-Mare	A1
Weybridge	A
Weymouth (including Portland Bill, excluding Portland Stoneyards)	A1
Whitby UD	A1
Whitby RD	A1
Whitehaven	A
Whitley & Monkseaton UD	A
Whitstable and District	A1
Wickford	A
Widnes	A
Wigan	A
Wigton	A1
Wilmslow	A
Wilts. County of	‡A1
Wimborne	A1
Wincanton	A1
Winchester	A1
Windermere	A1
Wisbech	A1
Witham	A1
Withernsea UD	A1
Woking	A1
Wokingham	A1
Wolverhampton CB	A
Wolverton District	A1
Woodbridge	A1
Woodhall Spa UD	A1
Woodstock	A1
Worcester CB	A
Workington	A
Worksop MB	A
Worthing	A1
Wrexham (incl. Cefn)	A
Wroughton	A1
Wylam	A
Wymondham	A1
Yate	A1
Yeovil Borough	A1
York CB	A
Ystalyfera	A

*For Birkenhead, Liverpool and London the rates are:—Craftsmen, 4s. 7½d.; Labourers, 4s. 1d. In the case of London the rate beyond the 12-mile radius is: Craftsmen, 4s. 7d.; Labourers, 4s. 0½d. †Plus 2d. per working day. ‡This is the County rate and applies except where higher grades are stated.

NOTE.—Carpenters and Joiners providing own tools when employed in establishments operating under the Supplementary Rules for Woodworking Factories and Shops, receive 2d. per day; when employed on other building industry work, 4d. per day.

WOMEN'S RATES.—In all districts throughout the country the rate of wages for women engaged in craft processes is 3s. 7½d. per hour. Women engaged on work other than craft processes, 3s. 3½d. per hour.

For Building Trade Wages in Scotland see page 434

The Builder Review of PLANT & MATERIALS

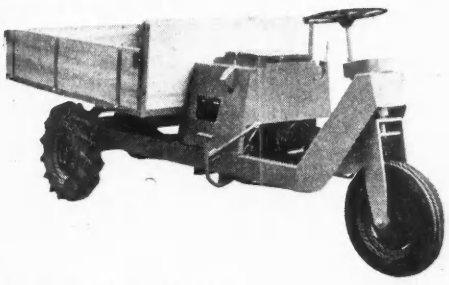
Passengers in Trucks

A PASSENGER-CARRYING conversion for trucks has recently been introduced by Whitlock Bros., Ltd., of Great Yeldham, Essex, and sizes are available for most makes of lorry or trailer. Constructed of tubular steel, a 10 ft. by 6 ft. model can be easily lifted on or off the vehicle by two men. With a headroom of 6 ft. 3 in. the covering is of green rotproof canvas with windows built into the front and the rear, and the rear can be either partly or fully enclosed.

Bench-type seats are fitted the full length both sides, but if the attachment is required only as a portable store, they can be omitted.

Sliding Doors and Gear

Geo. W. King, Ltd., door fittings department, Argyle Works, Stevenage, Herts, have recently published a sizeable work called 'Sliding Door Gear.' Containing 160 pages with all forms of doors and gear illustrated and detailed, the book is well indexed and attractively produced.



THREE-WHEELED TRUCK.—The 'Bonser' truck, by Frank Bonser & Co., Ltd., of Nottingham, has a capacity of one ton with a manual-tipping body. Powered by a 5/6 h.p. four-stroke petrol engine, it has a top speed of about 12 m.p.h.; a V.O. conversion is available

TRADE NEWS

New Name for Irish Firm

THE name of the Irish Wallboard Co., Ltd., has been changed to Bowaters Irish Wallboard Mills, Ltd. There will be no change in the structure and marketing policy of the company which, since 1950, has been a member of the Bowater Organisation.

Divining Specialists

A guaranteed result, no water, no charge, is the claim of Kelly & Bennett, 1, Newstreet, Longford, Ireland, who are water and mineral diviners and artesian well borers.

BATHROOM WATER HEATER.—A new instantaneous water heater for the bathroom has been produced by Main Water Heaters, Ltd., 48, Grosvenor Gardens, London, SW1. Called the 'Jason,' it has a heat output of 75,000 BThU/hr and the finish is in white vitreous enamel and anodised aluminium

Main Distributors

John Gibbs & Son, Ltd., 72, 76, Dukestreet, Liverpool, 1, have been appointed main distributors for the 'Pak-a-way' warm air heating system in Cheshire, Lancashire, Flintshire and Denbighshire, and are now in process of appointing agents in those counties.

Prices Reduced

Sealdraught, Ltd., 229, Regent-street, London, W1, who market the self-adhesive 'Stick-a-seal' plastic foam, announce that relaxation in purchase tax has effected a reduction in the price of this weatherstrip.

New Range of Rooflights

A range of Perspex rooflights has been introduced to this country by Cordar Roof Lights, 34, Dean-st., Newcastle upon Tyne, 1. They are mounted quite simply by screwing through preformed holes to a timber upstand formed in the normal way, or to timber fillets in a concrete upstand. Characteristics include, standard sizes; 22 in. by 34 in.; 34 in. by 45¾ in.; 45¼ in. square; 45¾ in. by 93 in.; and 69⅜ in. square. Also there are three circular models, 34 in., 45¾ in. and 69⅜ in. in diameter. These dimensions include the fixing rim and a one-inch weathering; internal sizes are approximately 6½ in. smaller in each direction. The transference of light is 92pc, compared with 80pc for wired roughcast glass; 50pc ultraviolet light is transferred. The material is non-splintering and, because Perspex is a poor conductor of heat, its U-value is four times that of glass; double skinned rooflights are available for high degrees of heat insulation. The single skin of Perspex is 4.75mm. thick.

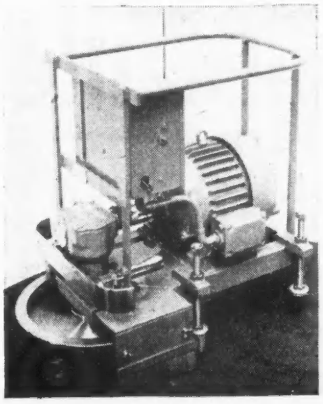
New Slotted Angle

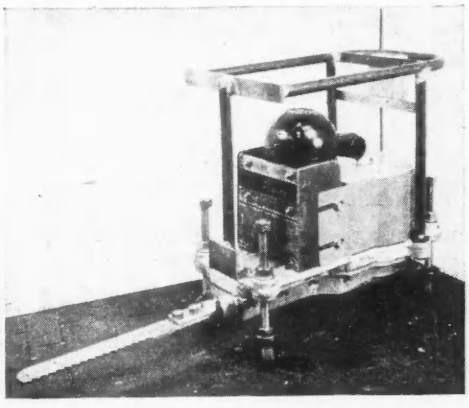
Rubery Owen and Co., Ltd., of Wrexham, have entered the slotted angle field with 'Owen-angle.' Made in three sizes from cold-rolled steel, it can be supplied to specification or in packs of 100 ft., complete with nuts and bolts.

Solid Fuel Fire

The latest open and closed stove on the market, the 'Sunglow,' it is claimed, will heat rooms from 1,750 to 2,750 cu. ft. capacity. Continuous burning on all fuels, it will burn for a minimum of ten hours without attention, consuming on an average from ½ lb. to 1.6 lb. of fuel per hour. It is made in six vitreous enamel finishes by Federated Foundries, Ltd., 4, Stratford-place, W1.

DAMP-PROOF COURSE CUTTING MACHINES.—A new DPC membrane can be inserted into an existing brick wall at the rate of 60 to 80 ft. per day, it is claimed, using Brooks 'Major' and 'Senior' cutting machines. Made by Brooks D.P.C. Machine Co., Granville Mill, Vulcan-st., Oldham, Lancs, the machines can be either bought or hired. The machines are electric powered by a 2 h.p. single-phase that can be run from a domestic supply; petrol or diesel engined models are available. The 'Major' model has a circular blade giving a five-inch cut. The 'Senior' model has a straight blade and is used for cutting reveals, etc., where the circular blade cannot reach. When a cut has been made right through a brick wall, in short lengths, a flexible DPC is inserted and wedged with slate, the whole being grouted afterwards to complete the structural wall





NEW COMPANIES

THE FOLLOWING NEW COMPANIES, registered in England, have been announced by Jordan and Sons, Ltd., company registration agents.

Hubbards Chase Developments, Ltd. (585429.) Reg. June 12. 153, Fenchurch-st., EC3. Nom. cap.: £5,000. Dir.: Mrs. L. Hurst.

Willoughby J. Moore & Sons, Ltd. (585461.) Reg. June 12. 60, Painswick-rd., Cheltenham. Bldrs. Nom. cap.: £2,000. Dir.: W. J. Moore.

W. N. Dandridge & Son, Ltd. (585462.) Reg. June 12. 15, Lullington Garth, N. Finchley, N12. Bldrs. Nom. cap.: £100. Dir.: W. N. Dandridge.

K. Fowler & Co., Ltd. (585482.) Regd. June 13. 11, Station-cres., Westcombe Park, SE3. Bldrs., etc. Nom. cap.: £1,000. Dir.: K. Fowler.

Noray, Ltd. (585556.) Reg. June 14. 71, Albion-st., Leeds, 1. Bldrs. Nom. cap.: £500. Dir.: N. Cline.

Broadlea Developments, Ltd. (585569.) Regd. June 14. 6, Clanricarde-gdns., W2. Bldrs. Nom. cap.: £6,000. Dir.: A. Braff.

Cothliff Bros., Ltd. (585575.) Regd. June 14. 82, Wadham-rd., Bootle, Lancs. Bldrs. Nom. cap.: £3,000. Dir.: G. P. Cothliff.

Stanley V. Flathers, Ltd. (585623.) Regd. June 17. 26, Broadway, Barnsley. Bldrs. Nom. cap.: £2,000. Dir.: S. V. Flathers.

John Crisp, Ltd. (585638.) Regd. June 17. 78-80, Wellington-st., Woolwich, SE18. Bldrs., contrs. Nom. cap.: £10,000. Dir.: E. H. Crisp.

Ellispal, Ltd. (585653.) Regd. June 17. 156, Strand, WC2. Bldrs. Nom. cap.: £100. Sub.: Jean Herbert.

Cheltpyle Building Co., Ltd. (585684.) Regd. June 18. 156, Strand, WC2. Nom. cap.: £100. Sub.: Jean Herbert.

Dowbints Building Co., Ltd. (585685.) Regd. June 18. 156, Strand, WC2. Nom. cap.: £100. Sub.: Jean Herbert.

Frank Tyler (Decorations), Ltd. (585702.) Regd. June 18. Bldrs., contrs., etc. Nom. cap.: £1,000. Sub.: A. C. Lee, 31, Parkstone-rd., Leicester (clk).

Raymond Parker & Co., Ltd. (585717.) Regd. June 18. 24, Walkden-ave. East, Wigan. Bldg. contrs. Nom. cap.: £2,000. Sub.: R. Parker.

Weaver Brothers, Ltd. (585726.) Regd. June 18. Lane End-rd., Bembridge, IoW. Bldr., contr., etc. Nom. cap.: £5,000. Dir.: A. P. Weaver.

R. B. Burgess, Ltd. (585757.) Regd. June 18. Seaforth-hse., Bournemouth-rd., Parkstone, Dorset. Bldrs. Nom. cap.: £3,000. Dir.: R. B. Burgess.

Stapleton & Co. (Gosport), Ltd. (585761.) Regd. June 18. 73, Brockhurst-rd., Gosport, Hants. Bldrs. Nom. cap.: £4,000. Permt. dir.: H. Beale.

Court Farm (Flats) Development Co., Ltd. (585767.) Regd. June 19. Regent-hse., Princes-pl., Brighton, 1. Nom. cap.: £100. Dir.: H. W. Rawlinson.

R. G. Luck & Co., Ltd. (585784.) Regd. June 19. 33, Estcourt-rd., Gloucester. Bldrs. and civ. engrs. Nom. cap.: £2,000. Permt. dir.: R. G. Luck.

Burden & Williams (Builders), Ltd. (585796.) Regd. June 19. 7, Selly-walk, Withywood, Bristol, 3. Nom. cap.: £1,000. Dir.: C. C. Burden.

F. Tappenden & Son (Portishead), Ltd. (585801.) Regd. June 19. Bird Tree Cottage High-st., Portishead, Som. Bldrs., contrs. Nom. cap.: £5,000. Dir.: R. E. Tappenden.

Pettet Bros., Ltd. (585809.) Regd. June 19. Ponswood Works, Theaklen-dri., St. Leonards-on-Sea. Bldrs., contrs. Nom. cap.: £500. Dir.: A. E. Deller.

Hugh Lord (Coventry), Ltd. (585870.) Regd. June 20. 48, Wordsworth-rd., Coventry. Bldrs. Nom. cap.: £3,000. Permt. dir.: H. Lord.

Newsan (Liverpool), Ltd. (586004.) Regd. June 24. Bldrs. Nom. cap.: £200. Sub.: R. Rudd, 137, Easton-rd., Roby, Lancs.

Wessexhomes, Ltd. (586051.) Regd. June 24. Bldrs. Nom. cap.: £1,000. Dir.: A. D. Abrey, The Firs, Bevere-grn., Worcester.

Frank Perfect & Sons, Ltd. (585902.) Regd. June 20. Church-rd., Penn, Bucks. Bldrs. Nom. cap.: £10,000. Dir.: F. G. Perfect.

Haycol Construction & Development Co., Ltd. (585904.) Regd. June 20. 46, Grafton-rd., Selsey, Sussex. Nom. cap.: £100. Dir.: G. R. Collins.

James H. Winstone & Son, Ltd. (585906.) Regd. June 20. 262, Winchester-rd., Southampton. Bldr. and contr. Nom. cap.: £5,000. Permt. dir.: J. H. Winstone.

Little Bushey Development Co., Ltd. (585909.) Regd. June 20. Bldrs. Nom. cap.: £1,000. Sub.: S. Walters, 9, Strathmore-crt., NW8.

Tower Casements, Ltd. (585940.) Regd. June 21. 2, Trinity-st., Hastings, Sussex. Bldrs., etc. Nom. cap.: £1,000. Dir.: A. P. Hilder.

Blake & Co. (Builders), Ltd. (586069.) Regd. June 24. Adanac, Crabwood-rd., Southampton. Nom. cap.: £300. Dir.: G. R. Blake.

Annsu Co., Ltd. (586085.) Regd. June 25. 11, Middle-row, Stevenage, Herts. Bldrs. and contrs. Nom. cap.: £100. Dir.: Pauline I. Burrows.

Bassett of Newhaven, Ltd. (586087.) Regd. June 25. 194, Tarring-rd., Worthing. Bldrs. and contrs. Nom. cap.: £1,000. Dir.: R. A. E. Bassett.

Edwards' Roads and Drives, Ltd. (586094.) Regd. June 25. George-st. Chambers, Staines, Middx. Public works contrs. and civ. eng. Nom. cap.: £1,000. Dir.: S. A. Edwards.

Greenaway (Ilford), Ltd. (584103.) Regd. June 25. Highlands Estate Office, 141, The Drive, Ilford. Bldrs. Nom. cap.: £100. Dir.: A. J. Greenaway.

Joseph Broster & Son, Ltd. (586112.) Regd. June 25. 17, Clarendon-st., Liverpool, 7. Bldrs. Nom. cap.: £5,000. Permt. dir.: J. S. Broster.

Ainsworth Steel Construction Co., Ltd. (586134.) Regd. June 25. 110, King's-rd., Chelsea, SW. Nom. cap.: £20,000. Dir.: J. Brownbridge.

J. P. & M. Anderson, Ltd. (586145.) Regd. June 25. 110, Bolton Hall-rd., Bolton Woods, Bradford. Bldrs. Nom. cap.: £500. Dir.: J. P. Anderson.

Abbotts Ann Development Co., Ltd., (586154.) Regd. June 25. 21, Bridge-st., Andover, Hants. Bldrs. Nom. cap.: £3,000. Dir.: A. H. Elmes.

David Charles Estates, Ltd. (586156.) Regd. June 25. 45, Green-la., Birmingham, 10. Nom. cap.: £10,000. Bldrs. and contrs. Dir.: C. Bennett.

Baxter Bros. (Building Contractors), Ltd. (586179.) Regd. June 26. 9, New-st., Grimsby. Nom. cap.: £5,000. Permt. dir.: D. A. Baxter.

Meadow Development (Norwich), Ltd. (586234.) Regd. June 26. Bldrs. Nom. cap.: £5,000. Dir.: G. N. Roe, 25, Burma-rd., Old Catton, Norwich.

Rhodes Bros., Ltd. (586239.) Regd. June 26. 6, Gate-st., Lincolns Inn Fields, WC2. Bldr., etc. Nom. cap.: £5,000. Dir.: C. F. Rhodes.

A. R. Brinsden, Ltd. (586245.) Regd. June 27. Bldrs. Nom. cap.: £100. Sub.: A. R. Brinsden. 16, King Harry-la., St. Albans.

Alfred J. Davey (Bromley), Ltd. (586278.) Regd. June 27. 3, Exmouth-rd., Bromley, Kent. Bldrs., contrs. Nom. cap.: £100. Dir.: A. J. Davey.

Stanley V. Davis, Ltd. (586295.) Regd. June 27. Fifield, Oxon. Bldrs., contrs. Nom. cap.: £5,000. Dir.: S. V. Davis.

Pemberton & Co. (Builders), Ltd. (586313.) Regd. June 27. Lloyds Bank-chbrs., Terminus-rd., Eastbourne. Nom. cap.: £100. Dir.: H. Pemberton.

R. Jarvis (Builders), Ltd. (586314.) Regd. June 27. High-st., Cross-in-Hand, Sussex. Bldr. Nom. cap.: £1,000. Dir.: A. J. Jarvis.

A. & J. Vickers, Ltd. (586330.) Regd. June 28. 91, High Storrs-rd., Sheffield. Bldrs. Nom. cap.: £3,000. Dir.: J. Vickers.

Fennell & Roberts, Ltd. (586337.) Regd. June 28. 300, Eastwood-rd., Rayleigh, Essex. Bldrs. Nom. cap.: £100. Dir.: Mrs. L. A. Fennell.

Clifton Builders (Bristol), Ltd. (586365.) Regd. June 28. 189, Manor-rd., Fishponds, Bristol. Nom. cap.: £1,000. Dir.: A. J. Filer.

C. T. Webb & Sons, Ltd. (586369.) Regd. June 28. Hatchett Gate, Beaulieu, Hants. Bldrs. Nom. cap.: £5,000. Dir.: B. T. Webb.

C. T. Bishop & Son, Ltd. (586440.) Regd. July 1. White House, Marden, Herefordshire. Bldg. contrs. Nom. cap.: £6,000. Dir.: C. T. Bishop.

J. & W. Maxey, Ltd. (586485.) Regd. July 1. 11a, St. Albans-rd., Watford, Herts. Bldrs. Nom. cap.: £1,000. Dir.: J. H. Maxey.

Lucas (Contractors), Ltd. (586488.) Regd. July 1. 67, Mill-rd., Burgess Hill, Sussex. Bldrs. Nom. cap.: £100. Dir.: J. F. Lucas.

E. C. Tapp & Sons, Ltd. (586503.) Regd. July 1. 30, Selden-rd., Worthing. Bldrs. Nom. cap.: £2,000. Permt. dir.: E. C. Tapp.

G. & J. Waterman, Ltd. (586518.) Regd. July 1. 103, High-st., Watford. Bldrs. and genl. contrs. Nom. cap.: £10,000. Dir.: N. Heather.

G. F. Violet, Ltd. (586519.) Regd. July 1. 4, Park-terr., Commercial-rd., Parkstone, Dorset. Bldrs. Nom. cap.: £3,000. Permt. dir.: G. F. Violet.

Young & Gibbons (Builders), Ltd. (586534.) Regd. July 1. 57, Woodford-rd., South Woodford, E18. Nom. cap.: £1,000. Dir.: C. T. Young.

S. Gilbert, Ltd. (586541.) Regd. July 1. 104, Ashcroft-rd., Luton. Bldrs. Nom. cap.: £6,000. Dir.: S. H. Gilbert.

R. Sleightholme, Ltd. (586606.) Regd. July 2. Chatsworth, The Oval, Benton, Newcastle-on-Tyne. Bldrs. Nom. cap.: £5,000. Dir.: R. Sleightholme.

Richard Costain (West Indies), Ltd. (586643.) Regd. July 2. Bldrs. and contrs. Nom. cap.: £100. Sub.: J. B. Parrett, 2, Cypress-av., Twickenham, Middx.

R. S. Porter (Contractors), Ltd. (586703.) Regd. July 3. R/O 272, Stanstead-rd., Hoddesdon, Herts. Bldrs., contrs. Nom. cap.: £2,000. Dir.: R. S. Porter.

FOREST PRODUCTS RESEARCH, 1956

Wide Range of Problems Investigated

THE report for 1956 of the Forest Products Research Board has now been published, together with the report of the Director of Forest Products Research. The reports are published in one volume by HMSO for DSIR (price 5s.).

The work carried out at the Forest Products Research Laboratory, Princes Risborough, during the year included fundamental research, technical investigations of particular interest to industry, and the provision of advisory services for importers and users of timber, plywood and other products.

Projects dealt with included the investigation of methods of fabricating and designing timber structures, the assessment of the properties of new exotic timbers, the grading of timbers and the study of the characteristics of joints in wood.

Timber Bending.—The testing of timbers to determine their steam bending properties has yielded information on some nine different woods, including muhuhu, light red seraya, greenheart, Tasmanian myrtle and European plane. The myrtle was found to be suitable for many types of solid bends and the bending properties of European plane were found to be similar to those of such well known bending species as ash and beech.

Work on beech has resulted in the development of an improved method of producing serpentine shapes of moulded cross section. The moulded lengths are first softened by steaming and then bent to shape between forms. The lengths are finally set to shape by heating by radio frequency methods for about eight minutes.

Strength Data—Structural Softwoods.—Work has commenced on the investigation of the strength properties of the most commonly imported structural softwoods. The species being investigated are Baltic redwood and whitewood, western hemlock and Douglas fir. Particular attention is being paid to obtaining information on the variations in strength to be expected in each species from the various producing areas, which may be as many as 45 different districts for one particular species. Baltic redwood samples, for instance, are being taken from shipments arriving in this country from various areas of nine northern European countries. Consignments of western hemlock and Baltic whitewood have also been tested.

High Speed Wood Cutting.—A new machine capable of operating at speeds up to nearly 8,000 feet per minute has been built to investigate chip formation and to study cutting forces throughout the speed range of the equipment.

It has been claimed that cutting speed has no effect on chip formation, but the results already obtained do not bear this out. Experiments made at various speeds and with varied cutting angles and depths of cut gave rise to information on 'lobster back' chip formation. The chip is formed in a long continuous shaving which fails in bending at regular intervals as it is deflected up the face of the cutter, the final form of the shaving being a coil. The length of the flats between the bending failures has been found to be related to the depth of cut and consequent chip thickness. Studies are continuing with the aid of the new machine.

Radio Frequency Heating of Glued Joints.—In investigating the radio frequency heating of wood joints it was found that the most efficient heating method for joints in plywood up to 3/13th in. thick was the use of flat electrodes on the opposite sides of the wood to the glue layer. For wood sizes over ¼ in. however, it was found that true glue line heating had to be used, despite the danger of arcing likely to result from the contamination of the electrode.

Radio frequency heating, using flat side electrodes, has also been applied to the manufacture of laminated beams. In order to assess the uniformity of the heating between the electrodes a method involving visual indication has been developed. Strips of universal indicator paper are laid on the glue line immediately after the spreading of glue. The pH value of aproximately 7 is shown by the paper turning green. At the end of the heating period the laminae are separated to reveal the paper. If a bright red colour, indicating a pH of approximately 2 is revealed, the adhesive has set. This method can be used to determine the progress of the setting of the adhesive.

Death Watch Beetle Being Eradicated from HMS Victory.—There is reason to hope that HMS Victory may be cleared of infestation by death watch beetle. A third fumigation of the ship was carried out during the year. As in the former year the treatment took place halfway through the emergence period of the beetle in order to obtain information on the effect of the two previous treatments.

The number of insects collected on the ship during the emergence periods indicates that the technique is effective. During 1953, before fumigation was undertaken, more than 5,000 beetles were collected. During 1956 the total was only 230.

PLUMBING IN BUILDING

By Sydney Webster, A.R.I.B.A.

Recent substantial changes in materials and techniques make this new book invaluable. The author is Lecturer in Building Construction at the L.C.C. School of Building, Brixton, and a practising architect. Specialised fittings, prefabrication and scientific installation methods receive particular attention. 25/- (Postage 1s. 2d.)

DRAINAGE AND SANITATION

By E. H. Blake and W. R. Jenkins

New sections on factory drainage, ventilation and warming, on district heating and on solid fuel appliances, have been added to the new, eleventh edition of "Blake." Also the whole work has been revised, reset and re-illustrated. Over 500 pp.

21/- (Postage 1s. 2d.)

B. T. BATSFORD LTD.

4 Fitzhardinge Street, London, W.1

OVERSEAS BUILDING

From Our Own Correspondents

HONDURAS.—The International Bank for Reconstruction and Development is said to be considering a Honduran request for a loan to assist in building a 50 mile road to link Puerto Cortes with Bufalo. . . . A project for the redevelopment of the Aguan Valley has been submitted to the Honduran Government by a private development company. The scheme envisages the clearing up of 50,000 hectares of land, the building of 250 homes, extension and development of the deep harbour at Puerto Castilla, building of new warehouses, a new loading pier and the installation of fruit canning factories. . . . Plans are under study for the conversion of the airfield at San Pedro Sula into an international airport. . . . An Export-Import Bank loan has been approved for the improvement of drinking-water supplies for 29 towns. Altogether about $3m. will be spent. It is understood that this loan will also cover road and bridge building and further road development. . . . A second new sugar refinery is to be erected by the Cia. Azucarera Hondurena in the San Pedro Sula area. It is likely to be fully automatic and very modern. The company has requested the loan of $1m. from the Export-Import Bank. . . . Plans for the Rio Lindo hydro-electric scheme and for the revision of the electricity distribution system in Tegucigalpa have now been submitted to the Honduran Government and to the International Bank which will probably help to finance the whole project. The Harza Electric Company International, the consultants who prepared the scheme, propose a 4-stage scheme for the eventual production of 168,000 kwh at Rio Lindo. The first, which will take three years to complete will lead to the production of 25,000 kwh at an overall cost of $17m. . . . A national Electrical Authority has now been formed to supervise, systematise and finance the development of electric power in Honduras. The Government has a new paper and pulp factory project in the planning stage.

IRAQ.—The Development Board have awarded the contract for land development and preparation at the Mosul housing scheme to Awar and Partners (Iraqi) jointly with Contracts and Development Engineering Ltd. (Iraqi). . . Plans have now been prepared and tenders are expected shortly for housing schemes at Kelbala (1,000 houses) and also at Sulaimaniyah, Hilla, Kerbala and Diwaniyah. . . . For the construction of the Daura Bridge in Bagdad, the Development Board have adopted a new method of inviting tenders; bridge-building firms of repute may submit their own designs and specifications to the consultants who will thereafter report to the Board on the most suitable offer. Designs and specifications for three major hospital projects in Iraq have been entrusted to the Australian architects Stephenson and Turner, of Melbourne. The hospitals are to be built at Basra, Amara and Khadimain.

NEW ZEALAND.—75 per cent. or more of the £256m. the New Zealand Government will spend on power development in the next 13 years will be spent in the South

Island. The scheme calls for the construction of a permanent town, with a population of 5,000 in the Waitaki river basin. It is on the Waitaki River that the giant Benmore station (480,000kw) is to be built. The site of the Waitaki basin town has not yet been announced but it will be very close to the junction of the Waitaki and Ahuriri rivers where the dam will be built.

SPAIN.—The Barcelona Chamber of Industry is investigating the possibilities of building an atomic power station at Barcelona. . . . The Soria Municipality have been granted a large credit for improvements to the city's water supplies. New pumping stations, purifying plant and pipes are to be installed.

THAILAND.—The Ministry of Public Health are reported to be planning to build a hospital for men, of 200 to 300 beds and to have selected a site for the purpose in the Phyathai section of Bangkok not far from the hospital for nervous diseases at present under construction.

Technical Representation in USA

Madison Trading Co. Inc. has formed a new division to be known as 'Samples Services Division,' which will have its offices at No. 274 Madison-avenue, New York City. Its function will be to aid foreign manufacturers and technicians in procuring technical information about and samples of American products.

The company will welcome the opportunity to represent foreign manufacturers and through its resources would be able to procure samples of new American products to forward abroad. Full details of this service can be obtained by writing for Bulletin FP 937 which the company would be prepared to forward to interested parties.

Far East Air Base Contract

A contract for constructing the new Indian Ocean air base in the Maldive Islands, to replace the existing base in Ceylon, has been let to Richard Costain Ltd. Work is to start immediately on the £2m. project and will last for about two years. The plant and machinery to be used, as well as the hutting and main materials, will be obtained from Britain. Supervisory staff will be British, the work being carried out for the Air Ministry as part of the new strategic defence programme for the Far East.

OVERSEAS AGENCIES

***British Guiana.**—Hull Jones and Co. (British Guiana). Ltd., PO Box 443, Georgetown, Demerara, have informed the UK Trade Commissioner at Port of Spain that they wish to represent United Kingdom manufacturers of a range of goods which includes galvanised zinc sheets, nails and floor coverings similar to linoleum. Manufacturers interested should write direct to the Georgetown firm. (Ref.: ESB/20576/57; tel.: Chancery 4411, ext. 776 or 866).

***Canada.**—The UK Trade Commissioner in Toronto has been approached by a well-known Toronto firm with branches in Montreal and Vancouver who specialise in the distribution of maintenance equipment for buildings and factories, and who are interested in representing UK manufacturers of line-marking machines, materials handling equipment, and general equipment for building and factory maintenance. Firms interested should write to the Trade Commissioner, 119, Adelaide-st. West, Toronto, Ontario, quoting reference 1148. (Ref. ESB/20629/57; Tel.: Chancery 4411, ext. 776 or 866).

USA.—Kinnane Machinery Co., 2727, First-avenue So., Seattle 4, Washington, have informed the British Consulate-General at Seattle that they are seeking an agency representation for a medium-priced 13 in. to 18 in. geared head lathe similar to the 'Regal' LeBlond lathe with hardened ways and spindle speeds up to 1,500 to 1,800 rpm, an illustration of which is available for inspection in Room 805, Lacon House, WC1. Manufacturers interested should write by air mail direct to Kinnane Machinery Co. It is important that quotations should show both FOB and CIF prices in US currency (Ref. ESB/18401/57; Tel.: Chancery 4411, ext. 776 or 866).

* From the Board of Trade Special Register Information Service. The telephone number and extension at the end of the paragraphs relate to the department of the Export Service Branch, Lacon House, Theobalds-road, WC1, where further information can be obtained.

The
SCOTTISH
BUILDER

Partick Granary Extension

THE Clyde Navigation Trust's extension to Meadowside Granary at Partick, Glasgow, approved in November, 1955, at a cost of £3 million, is now under construction after site clearance. The new granary will have a capacity of 50,000 tons and double the existing Meadowside holding space. It will also allow faster turn round of grain ships to the Clyde.

An interesting feature is the erection of two Lieberherr giant tower cranes from Germany; the first is now in position and the second will follow within a few weeks. They are telescopic allowing reduction to half normal height for transportation. The crane, which is 130 ft. high, will lay material from the foundations to the roof 190 ft. high. Contractors for the project are Holt and Company of Edinburgh. Work is expected to be completed by October, 1959.

The Builder
Cost of Building Chart

Variations from 1914 to date

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and The Builder

'THE BUILDER' Cost of Building Chart, specially prepared for 'The Builder' by Mr. H. J. Venning, F.R.I.C.S., brought up to date and incorporating the recent wages award, has been reprinted on stiff card for convenience in handling. Copies may be obtained from the Publishers, price 1s. 3d. each, plus 3d. postage and packing for any number up to six, numbers above six being post free.

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SCOTTISH BUILDING TRADE WAGES

FOLLOWING are rates of wages authorised by the Scottish National Joint Council as from May 27, 1957. They apply to the whole of Scotland, including the islands of Orkney, Shetland, etc.

Grade A: Craftsmen 4s. 6d.: Labourers 3s. 11½d.

For apprentices, the rates are:

Year.	*Percentage of Craftsman's rate.*	*For week of 44 hours*
		s. d.
1st	25	49 6
2nd	33¼	66 0
3rd	50	99 0
4th	66⅔	132 0
5th	75	148 6

For female labour, the rates are:

	s. d.
Operatives on craft operations (at end of probationary period)	3 11½
Operatives on labouring operations (at end of probationary period)	3 5½

Scotland's Housing, July

THE number of new houses completed in Scotland in July was 1,648, bringing the total completed this year to 18,291, compared with 16,894 in the same period last year. This is shown in the monthly return prepared by the Department of Health for Scotland and the Ministry of Housing and Local Government published by HMSO.

There were 36,139 houses under construction at the end of July, compared with 38,272 a year ago. Of the 307,434 houses built in Scotland since the war, 275,604 were erected by local authorities, 1,283 by housing associations, 6,846 by government departments, and 23,701 by private builders.

NEW BUILDINGS

Angus CC.—Lintrathen Water Supply, Padaranum extension. 8 miles of a.c. pipes and relative work. Tenders to County E., County-bldgs., Forfar, by Sept. 11.

Fife CC.—Tenders invited for diverting and realigning Kelty-Crossgates and Kelty-Dunfermline roads at Cantsdam Junction, Kelty. Road improvement extends to 950 ft. and includes construction of a 20 ft. span reinforced concrete bridge. Several works. Applications to County S. County Office, Belfield, Cupar, Fife. Dep. £2 2s.

Glasgow.—Plans to be prepared for new library at Castlemilk, for Glasgow Corporation. Est. cost £20,000. City A, Trongate, Glasgow.

Glasgow.—Plans in hand for new Institute of Virology department building on site at Church-st. and Moy-st. for Glasgow University.

Glenrothes Development Corporation.—Tenders invited for work in connection with erection of 178 houses at Rimbleton, first development. Applications by Sept. 14 to Chief A.

Orkney.—Kirbister and Boardhouse water schemes—Contract No. 13, Towerhill and Greentoft Tanks. Two reinforced concrete tanks, one of 100,000 galls., and the other of 500,000 galls. capacity. Applications to Messrs. Crouch & Hogg, 18, Woodside-cres., Glasgow C3. Dep. £3 3s.

Perthshire.—Tenders invited for work in connection with erection of 12 houses at Stanley, 36 houses at Almondbank and 36 at Bridge of Earn. Applications to SSHA, Palmerston-pl., Edinburgh.

Selkirk.—Bannerfield Housing Scheme, fifth development, 12 houses. Eight contracts covering all trades. A: Basil Spence & Ptnrs, (A), 40, Moray-pl., Edinburgh. Tenders by Sept. 14.

SAFETY IN ELECTRICAL ENGINEERING

Codes and Regulations

DURING the period 1933-1935, ICI prepared a series of Engineering Safety Standards for use within its own organisation. These standards were intended to serve as a guide on safety matters to all concerned in the design, construction, operation or maintenance of the company's plants. The approach was primarily from the engineering aspect, and the Standards attempted to show how the best technical knowledge then available could be applied, having regard to existing factory legislation.

The original Standards served a valuable purpose and were of material assistance in reducing the accident frequency rate to less than one half of its former level within the company. This has encouraged them to revise and extend these safety manuals under the title of 'ICI Engineering Codes and Regulations (Safety).' They are made available to industry through the Royal Society for the Prevention of Accidents.

The latest edition to appear is the first of a series dealing with safety in relation to electrical engineering. The booklet reviews the whole field of legislation and other regulations relative to the use of electricity with safety in a chemical works, so that the engineer may consult the appropriate clauses which refer to any specific safety problem.

It is not, and does not pretend to be, a reprint of safety regulations *in extenso;* it is stressed that it should be read in conjunction with them. But it provides the electrical engineer with an invaluable 'ready reference' manual, containing pertinent extracts from Statutory Regulations and Requirements, Factories (Standard of Lighting) Regulations, the Electricity Factories Acts, and By-laws, Non-Statutory Regulations and miscellaneous memoranda.

All this is compressed in a 37-page booklet well indexed. There is also a British Standards Institution Sectional list of Standards applicable to electrical engineering included in a pocket folder.

Other Codes in the series cover: Electrical Plant Installations; Electrical Portable and Transportable Plant Equipment, Design, Layout and Installation of Machines; Construction and Maintenance (Mechanical Engineering), and Lifting Appliances. Sites and Service; Building and Structures; Railways and Haulage; Docks, Wharves and Quays; and Road Transport of Plant. (Published by RoSPA, Terminal House, 52, Grosvenor-gardens, SW1.)

PERSONAL COLUMN

MR. P. J. PARKHOUSE, having resigned his directorship of Jno. Croad, Ltd., Portsmouth, subsidiary of Trollope and Colls, Ltd., London, has now been appointed joint managing director of A. E. Porter and Son, Ltd., 57/61, Churchst., Portsmouth.

Three representatives who have joined the flooring department sales force of Armstrong Cork Company are MR. C. D. THOMAS (SE area, England), MR. E. J. MORRIS (Midlands area, England) and MR. H. A. WYER (Eire).

MR. E. N. LOWE, senior export executive of the BTR Group of Companies, will be leaving the UK on September 8 for a coast-to-coast business tour of Canada. The purpose of Mr. Lowe's trip, which will embrace all the major cities and industrial centres of the Dominion, is to expand the Group's business in Canadian markets.

The Builder FUTURE CONSTRUCTION

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

SEPTEMBER 11.

***Littlehampton UDC.**—12 houses (two contracts), Wickbourne estate. E&S. Dep. £2 2s. each.

SEPTEMBER 12.

***†Hampshire and Isle of Wight Police Authority.**—Police houses on three sites. City A, Winchester. Dep. £1 1s. each.

SEPTEMBER 13.

***†Birmingham City C.**—12 four-storey maisonettes at Court-la., Erdington. City A. Dep. £2 2s. Tenders by October 14.

***†Oxford City C.**—30 houses at London-rd., Headington. City A & Planning Officer.

***†Paddington MBC.**—46 dwellings between Hall-pl. and Campbell-st. TC. Dep. £2 2s.

SEPTEMBER 14.

***†Essex CC.**—Two additional classrooms and sundry adaptations at Maldon County prim. sch. County A.

***†Essex CC.**—Erection of Police Station and house at South Benfleet (est. cost £20,000). County A.

***†Weymouth and Melcombe Regis BC.**—New Ritz theatre and ballroom. S. Beverley (F), 35, Doughty-st., WC1.

SEPTEMBER 16.

***New Sarum City C.**—42 dwellings at Bishopdown estate, Salisbury. City E. Dep. £2.

***†Somerset CC.**—Erection of Bridgwater Municipal College (phase 1). County A.

SEPTEMBER 17.

***†Durham CC.**—Proposed improvements at Assize Courts. County A.

***Sunderland CB.**—Erection of boundary walls at approx. 800 houses at Springwell estate. Boro' A. Dep. £2 2s.

***Walton and Weybridge UDC.**—Convenience, Walton-on-Thames. E&S.

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SEPTEMBER 20.

***†Cheltenham.**—Showrooms for Sharpe & Fisher, Ltd., at Pittville-st. A: Rainger, Rogers & Smithson (F/F), Glenmore Lodge, Wellington-sq. Dep. £2 2s.

SEPTEMBER 21.

Trent River Board.—Home division depot (floor area approx. 9,000 ft. super and site works), near Trent Bridge. Bd.'s A: J. Dudding & Ptnrs., 30, Clarendon-st., Nottingham. Dep. £3 3s.

***†West Sussex CC.**—Extension Bourne sec. mod. sch., Southbourne, nr. Emsworth. City A, Chichester.

SEPTEMBER 23.

***Exmouth UDC.**—Conveniences, Littleham Village. E&S: R. J. Humphreys. Dep. £2 2s.

SEPTEMBER 25.

***Seaton UDC.**—Garage and store building at Colyford-rd. Depot. S. Dep. £2 2s.

SEPTEMBER 30.

***York City C.**—Family group home at Burton Stone-la. City A. Dep. £1.

OCTOBER 4.

***Slough BC.**—Two houses at Upton Court Park, Slough-rd., Datchet. Boro' E. Dep. £2 2s.

***Smethwick CBC.**—62 external access doors to fuel stores and 34 external coal houses. Boro' E&S. Dep. £2 2s.

OCTOBER 5.

***Bushey UDC.**—18 flats, Sparrows Herne. E&S. Dep. £3 3s.

OCTOBER 7.

Washington UDC.—87 houses at Coach-rd. site. E&S. Dep. £2 2s.

***Wrexham BC.**—28 flats and 14 garages, Queens Park. Boro' E&S. Dep. £2 2s.

OCTOBER 8.

***Burton-on-Trent BC.**—Social centre for blind, aged and other handicapped persons at Byrkley-st. Boro' A. Dep. £2 2s.

OCTOBER 10.

***Tynemouth CB.**—69 dwellings, Tyne-st. A: F. Austin Child (F), 6, Archbold-terr., Newcastle-upon-Tyne 2

OCTOBER 14.

***Castle Donnington RDC.**—4 pairs of houses and street works, Breedon-on-the-Hill. A: McCarthy, Collings & Co., 187, Forest-rd., Coalville. Dep. £3 3s.

OCTOBER 15.

***Brownhills UDC.**—35 dwellings at Mosspits, Shelfield. E&S., Coombe House. Dep. £2 2s.

OCTOBER 22.

***Salford City C.**—Cromwell sec. mod. sch. A: Cruickshank & Seward, 196, Deansgate, Manchester. Dep. £3 3s.

NO DATE.

***Sittingbourne and Milton UDC.**—Small shop with flat over at Canterbury-rd. estate. (Fixed price tender basis.) E&S. Dep. £3 3s.

PAINTING, MATERIALS, ETC.

SEPTEMBER 20.

***†St. Helens EC.**—Installation of central heating at new Technical College. Director of Education.

SEPTEMBER 21.

***†Beds EC.**—Installation of (a) engineering services: (b) electric light, etc., at new County prim. sch. at Gorham-way, Dunstable. County A.

SEPTEMBER 30.

***Woking UDC.**—Installation of hot and cold water supplies to 39 prewar houses. E&S. Dep. £2 2s.

OCTOBER 1.

***Northern Ireland Electricity Bd.**—Aluminium curtain walling at Coolkeeragh power station. Kennedy & Donkin, constg. engrs., 64, Royal Exchange, Manchester 2. Dep. £5 5s.

MUNICIPAL AND CIVIL ENGINEERING WORKS, ETC.

SEPTEMBER 16.

Ashton-under-Lyne BC.—220 yd. 48 in. dia. concrete tubes and ancillary works at Gambrel Bank Tip. Boro' S. Dep. £3 3s.

Biddulph UDC.—5,550 lin. yd. of 6 in. dia. CI water main at Park-la., Knypersley. E&S Dep. £3.

SEPTEMBER 17.

South Westmorland RDC.—Sewage disposal works and laying of 425 yd. 6 in. dia. sewers, with ancillary works, at Bowston. Ccl's E. Dep. £2 2s.

SEPTEMBER 18.

Crosby BC.—420 lin. yd. combined sewer, 9 in. and 12 in. dia., 11 precast concrete manholes, 460 lin. yd. kerbs and channels, 1,266 sq. yd. road works, etc., at Brownmoor-la. estate. Boro' E&S. Dep. £2 2s.

Great Yarmouth BC.—Flood prevention works—13,000 sq. ft. steel sheet piling, No. 2 Section, with concrete capping, anchor blocks and ancillary works. Boro' E. Dep. £2 2s.

Hertfordshire CC.—4,700 cu. yd. of excavation, filling, etc., 515 sq. yd. tarmacadam footway and ancillary work (330 yd.) at Hertford-Sawbridgeworth-rd., A414. County S.

SEPTEMBER 20.

Bedfordshire CC.—Reconstruction of Harrowden bridge, 25 ft. span in r.c., with ancillary road works, at Bedford-Hitchin-rd., A600. County S. Dep. £2.

Bedfordshire CC.—Construction of r.c. culvert and approach roads, drainage, etc., 7 ft. span, at Yelden. C. Dep. £2.

Berkshire CC.—1,150 lin. yd. of kerbing, 1,500 lin. yd. of concrete edging, 430 tons of tarmacadam, highway drainage and incidental works at Upper-rd., Kennington. County S. Dep. £2.

Doncaster RDC.—Sewage disposal works, 950 yd. of 6 in. stoneware and concrete pipes, manholes and ancillary works. S.

Leicester CC.—1,120 yd. road reconstruction at Cotesbach and Gibbet cross-roads, A426, and 830 yd. between Sutton and Cadeby, A447. County E&S. Dep. £5.

SEPTEMBER 21.

Macclesfield BC.—10,400 yd. super of carriageway pitched foundations, 5,150 lin. yd. kerb race, 2,000 lin. yd. of 6-15 in. dia. sewers and connections, with 46 brick manholes, at Weston Development Scheme No. 10. Boro' E. Dep. £2 2s.

SEPTEMBER 23.

Slough BC.—4,200 sq. yd. of concrete carriageway foundation, 8,900 sq. yd. of asphalt surfacing, 1,900 lin. yd. of kerbing, 800 lin. yd. of 9 in. water sewer and ancillary works at Chippenham-la. (Stage 1). Boro' E. Dep. £2 2s.

SEPTEMBER 25.

Banbury RDC.—Mass concrete underground storage reservoir of 9,000 galls. cap., with 6 in. feed pipework, at Duns Tew. E&S. Dep. £2 2s.

SEPTEMBER 30.

Horsham RDC.—6,100 lin. yd. of small dia. sewers, two sewage pumping stations, rising mains, a sewage disposal works and ancillary works. Howard Humphreys & Sons, constg. engrs., Victoria Station-hse., Victoria-st., SW1. Dep. £3 3s.

OCTOBER 7.

Hiraethog RDC.—Intake chamber and weir, treatment building, r.c. covered service reservoir 42,000 galls. cap., 3¼ miles of asbestos-cement mains and fittings up to 4 in. dia. at Capel-Garmon and Nebo water supply scheme. Howard Humphreys & Sons, constg. engrs., Victoria Station-hse., Victoria-st., SW1. Dep. £5 5s.

Newcastle City C.—860 yd. of 12-60 in. dia. sewer (plain and r.c.) pipes from Benton Bank to point near Jesmond Vale Bridge. City E. Dep. £2 2s.

Warwick RDC.—Two 200,000 galls. cap. water towers in r.c. at Lapworth and Hampton-on-Hill, borehole pumping station at Rowington, alterations to existing station at Shrewley and ancillary works. J. D. & D. M. Watson, constg. engrs., 18, Queen Anne's-gate, SW1. Dep. £10 10s.

NOVEMBER 13.

Wath RDC.—Pumped sewage disposal works and 1,414 yd. of sewer at Rainton. D. H. Moore, constg. engr., 12, Valley Bridge-par., Scarborough. Dep. £5 5s.

NO DATE.

Border RDC.—1,570 lin. yd. of 3 in. dia. water main in asbestos and spun cast-iron, small chlorination house, etc. Ccl's E. Dep. £2 2s.

Middlesex CC.—1½ miles of duel carriageways, drainage, footway and ancillary works between Woodfield-gdns. and Finchley-rd. County E. Dep. £10.

GENERAL BUILDING WORK

(LONDON)

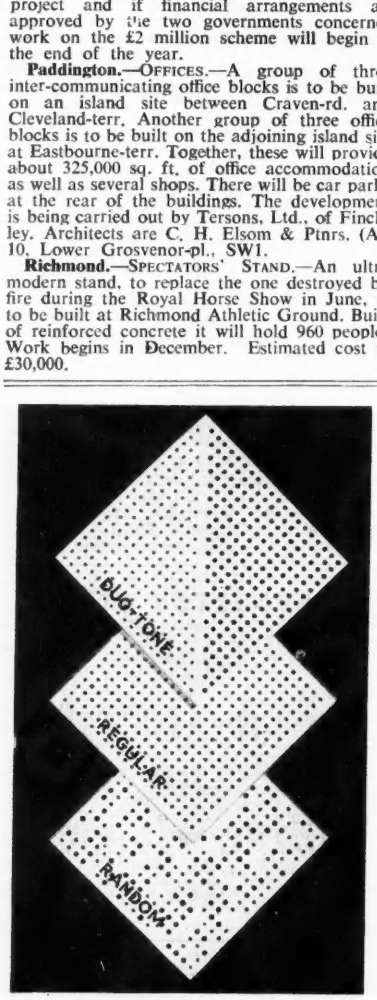
Bermondsey. — MAISONETTES. — Three interconnecting wings of nine-storey maisonettes connected to a central tower, are planned for the Luxford-st. area where the council is to build 52 homes.

London CC.—SCHOOL.—Plans to enlarge the Central School of Arts and Crafts, Theobalds-rd., have been announced. A new building, 12 storeys high is to be erected on a site at Red Lion-sq. and Parton-st. Into this building, on which the LCC hopes to begin work this autumn, will be moved three of the seven departments of the school. The Princeton College of Languages and Commerce will occupy part of the new building which will be of reinforced concrete construction and will take about three years to build. The estimated cost of the complete project is £896,610.

London (City).—HOTEL.—A 30-storey luxury hotel in Cadogan and Sloane squares is planned by the Hotel Corporation of America and financed partly by American, partly by British capital. Cussins (Contractors), Ltd., of Gosforth, have been recommended for the project and if financial arrangements are approved by the two governments concerned work on the £2 million scheme will begin at the end of the year.

Paddington.—OFFICES.—A group of three inter-communicating office blocks is to be built on an island site between Craven-rd. and Cleveland-terr. Another group of three office blocks is to be built on the adjoining island site at Eastbourne-terr. Together, these will provide about 325,000 sq. ft. of office accommodation as well as several shops. There will be car parks at the rear of the buildings. The development is being carried out by Tersons, Ltd., of Finchley. Architects are C. H. Elsom & Ptnrs. (A), 10, Lower Grosvenor-pl., SW1.

Richmond.—SPECTATORS' STAND.—An ultra modern stand, to replace the one destroyed by fire during the Royal Horse Show in June, is to be built at Richmond Athletic Ground. Built of reinforced concrete it will hold 960 people. Work begins in December. Estimated cost is £30,000.



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(PROVINCIAL)

Bedlington.—UDC has prepared revised estimate of £599,000 for proposed main sewerage scheme. S: A. K. Dennis.

Billingham-on-Tees.—UDC approved outline plan for development of houses in Low Grange area.

Bishop Auckland.—UDC to convert 375 houses to the water carriage system. S: J. Ford.

Blyth.—County police station to be modernised and enlarged. County A: C. C. Brown (A), County Hall, Newcastle.

Border, Cumberland.—RDC obtaining tenders for Low Row water supply scheme. Plans by Ccl's E., 7, Victoria-pl., Carlisle. Council also to place contract for 55 houses at Longtown. Plans by Housing A, 5, Victoria-pl., Carlisle.

Border (Cumberland).—Ministry inquiry expected in October into scheme for construction of large factory at Dalston for Nestlé Co., Ltd., Hayes, Middlesex.

Cambridge.—Plans approved by Local Planning Authority for shopping arcade, including two two-storey blocks of shops and one three-storey building, comprising shops and offices, linking St. Andrew's-st. and Drummer-st. bus station. A: Hughes & Bicknell (F/F), 1, Tunwell's-crt., Trumpington-st.

Cheltenham.—BC approved plans for 12 bungalows at Brakeville, Hatherley-rd.

Cheltenham.—BC approved plans for machine shop and store at Whaddon Works, Clyde-cres. for Walker, Crossweller, Ltd.

Cheltenham.—BC approved plans for single-storey prefabricated building for industrial weaving at Bouncers-la., for M. H. Godden, Ltd.

Chester-le-Street.—RDC to build 14 old persons' houses at Fatfield and 14 on Perkinsville site. No contracts let. A: F. Bowman (A), Estate Office, Great North Road, Birtley, Co. Durham.—RDC approved plans by County A. South-st., Durham, for canteen scullery, and reinstatement of classrooms at Birtley George mod. sch.

Consett.—RC Authorities propose erection of church, est. to cost £50,000. A: Rossi (A), 15, Melbourne-st., Consett, Co. Durham.

Crawley.—South-West Metropolitan Regional Hospital Board to develop site at West Green for first stage of hospital project. Stage 1 includes casualty, maternity and out-patient departments at a cost of £320,000.

Crook, Co. Durham.—Crook and Willington UDC to develop and lay out new housing estate. A: T. A. Page, Son & Hill (F/F), 75, King-st., South Shields.

Cumberland.—Home Office approved CC's proposals for erection of fire station at Egremont. County A: J. H. Haughan (F), Portland-sq., Carlisle.

Darlington.—TC approved plans for 54 houses at Skerne Park. Boro' A: E. A. Tornbohm (A).

Darlington.—TC to extend hospital at East Haven Home. Boro' A: E. A. Tornbohm (A). Central-bldgs.

Darlington.—Joshua Clayton & Deas (A), High Row, Darlington, are A for factory at McMullen-rd. for Daralum Castings, Ltd.

Durham.—CC to build prefabricated steel bridges across River Wear at Croxdale and Browney Colliery. County S: K. G. Miller.

Durham.—Men's residential college at Durham City for University of Durham. £325,000 est. A: T. Worthington & Sons (F/F), 178, Oxford-rd., Manchester.

Durham CC.—Conversion of Consett grammar sch. into technical coll. Extensive alterations. County A: G. R. Clayton (F), South-st., Durham.

Durham.—Pithead baths planned at Stargate, Clara Vale, Emma and Tanfield Lea North Collieries. NCB Architects' Dept., 24, The Side, Newcastle-on-Tyne.

Durham.—MH&LG approved joint proposals by Sunderland and South Shields Water Co., John-st., Sunderland, and Durham County Water Board, Durham City, for construction of reservoir (11 billion galls.) at Derwent Valley. Water Co's Chief E: A. G. McLellan. A. C. Wildsmith, Water Board's E. Work on the scheme will begin early next year and take at least five years to carry out.

Durham.—CC obtaining tenders for civil defence centre at Seaham and old people's hostel at Consett. Plans by County A: G. R. Clayton (F), South-st., Durham.

Easington.—NCB (No. 2 Area). Old Eye Infirmary, Sunderland, to erect nine houses nr. Murton-st, Murton.

Felling-on-Tyne.—UDC preparing plans for swimming bath and 25-acre park, to cost over £20,000. S: H. Fawcett.

Felling, County Durham.—E. A. Gunning (A), 18, Eldon-sq., Newcastle-on-Tyne, preparing plans for construction of Presbytery at Queen Victoria-st., Pelaw.

Gateshead.—TC considering proposals for new bank premises at Pillars Yard, High-st., Gateshead, for Martins Bank, Ltd.

Gateshead.—Marshall & Tweedy (A), 36, Blackett-st., Newcastle-on-Tyne, are architects for proposed factory, etc., for W. & T. Avery, Ltd.

Gateshead.—TC approved in principle a £13,500 scheme for new public conveniences at Askew-rd. West, Gateshead. Boro' E: G. F. Winters.—Ministry approved TC's proposal to spend £13,050 on roads and sewers at Lyndhurst estate.—Gateshead Central Social Club propose new club premises at High-st. and Leonards-ct. A: Arthur & Kirkup, 13, Swinburne-st., Gateshead.

Hexam.—Newcastle & Gateshead Water Co., Pilgrim-st., Newcastle-on-Tyne, to take over UDC's water supply system. Firm to spend over £70,000 on construction of new mains, etc.

Loftus, Yorks.—UDC to erect 150 houses at Easington. S: W. C. Ranson.

Manchester.—TC approved erection of six semi-detached and two detached houses on land between 38 and 44, Victoria-rd., Whalley Range, block of six flats at Catherine-rd., Crumpsall, 13 houses and garages at Calve Croft-rd., Peel Hall, Wythenshawe, 25 lock-up garages and 9 ft. boundary wall at Beresford-rd. and Stamford-rd., Longsight, experimental building, canteen and sanitary accommodation at Coll. of Tech., Jackson-st., and Burma-st., two shops with flats over, one pair of semi-detached bungalows and 54 lock-up garages on site between Burnage-la., and Lindsay-rd.

Middlesbrough.—TC agreed to support proposal of the Regent Oil Co., Ltd., to build petrol-filling station with frontage of 167 ft. and depth of 80 ft. at Acklam-rd. Road widening will be necessary.

Newcastle-on-Tyne.—City C approved plans for 234 flats and maisonettes in three- and five-storey blocks, 10 shops with 20 flats at Noble-st. Boro' E: J. A. Kenyon, Municipal-bldgs.

Newcastle-on-Tyne.—Boots, Chemists, London, to convert the Monument Hotel, Grainger-st., for extensions to their shop premises.

Newcastle-on-Tyne.—City C acquiring land and property in connection with scheme for traffic roundabout at junction of Pilgrim-st., Mosley-st. and City-rd. £200,000 est. City E: P. Parr, Town Hall.

Northumberland.—CC to build new RC school nr. The Broadway, Gosforth. County A: C. C. Brown (A), County Hall, Newcastle-on-Tyne.

Northumberland.—CC has received permission from Ministry to proceed with construction of old people's home at Cowpen, Blyth, £35,000 est. County A: C. C. Brown (A), County Hall, Newcastle-on-Tyne.

North Shields.—Thomas De La Rue, Ltd., to carry out extension scheme at their North Shields factory, £1 million est. The work will be done in stages over a period of four years. First stage entails ... covering 200,000 sq. ft. Constg. eng..., ... Bedford, 41, New Bond-st., W1.

Nottinghamshire.—MoE has approved proposals for two building schemes at Magnus grammar sch. and Lilley and Stone Girls' High sch. £173,000 est. These will be included in the 1958-59 building programme.

Sedgefield.—MH&LG approved tender of Bell & Ridley, Ltd., North-rd., Durham, accepted by RDC for 14 bungalows at Chilton and 56 houses at Trimdon Village. Housing A: R. Dobson.

Sheffield.—TC proposes erection of new motor omnibus garage at Olive Grove-rd.—To lease site at Chatham-st. to Electrical Components, Ltd., as site for new warehouse.—Appointed J. R. Lversidge, London, as constg. engr. for point block of flats at Greenhill/Bradway estate.

Solihull.—TC approved scheme for erection of 11 aged person's dwellings at Grove-rd. estate, £14,017 est.

Southampton.—MOH&LG approved plans in principle for swimming baths and lido on site of 7.68 acres at Western Esplanade and West Quay-rd. Stage 1 will include indoor pool, children's pool, slipper baths, laundry, restaurant, and seating for 900 spectators. £474,000 est. An open-air lido, seating a further 2,000 people, and large car park proposed in second stage. Boro' A: L. Berger (A), constg. engrs., L. G. Mouchel & Ptnrs., Ltd., Victoria-st., London.

South Shields.—Quantities being prepared for public-house in Dickens-ave. for Westoe Breweries, Ltd., and in Tasmania-rd. for McEwan & Co., Ltd. Tenders expected soon. A: T. A. Page, Son & Hill (F/F), 75, King-st., South Shields.

South Shields.—Factory and offices proposed at Derby-st. for Elsy & Gibbons, Ltd. A: T. A. Page, Son & Hill (F/F), 75, King-st., South Shields.

Stokesley, Yorks.—RDC considering sewage disposal schemes for seven villages to cost over £244,000.

Sunderland.—William Doxford & Sons, Ltd., Pallion, to build workshop for construction of tanks for ships.

Tideswell, Derbys.—Ex-Servicemen's Club, Ltd., to commence work shortly on erection of new club premises.

Tynemouth.—TC approved plans for 21 three-bedroomed houses at Bolan-gr. Boro' S: D. O'Herlihy.

Walsall.—TC seeks loan of £60,480 for erection of jun. dept. at Gipsy-la. county prim. sch.

Washington, Co. Durham.—UDC propose 87 houses at Coach-rd. site. S: T. E. Crowe.

TENDERS

* Denotes *accepted.*
† Denotes *provisionally accepted.*
‡ Denotes *recommended for acceptance.*
§ Denotes *accepted subject to modification.*
¶ Denotes *accepted by H.M. Government Departments.*

Aldridge.—260 dwellings at Leighswood estate, for UDC. E&S. QS: T. Pemberton. *146, F. A. & H. Taylor, Ltd., Bloxwich. 114, Rock & Downes, Ltd., Aldridge. Contract awarded in two sections.

Bedlington.—New park near Cleasewell Hill housing estate, for UDC. S: A. K. Dennis. *Direct labour. £12,000.

Birmingham.—Works, for City E. City A: A. G. Sheppard Fidler (F), AMPTI. 80 dwellings and 14 garages at Perry Villa estate. *Geo. Stubbins, Ltd. £163,761; 4 houses and tenants' room, Shepley-rd., Rednal House estate. *A. W. Houghton. £13,427; 232 dwellings, 62 garages, Kingshurst Hall estate, Part 2. *H. Dare & Son, Ltd. £440,569; 6 dwellings, Nechells Park-rd. *Richards & Wallington, Ltd. £11,090; 40 dwellings and 14 garages, Kyngsford-rd., Tile Cross. *C. Bryant & Son, Ltd. £83,387 (provisional revised tender); garage, office and canteen, Brookvale-rd., salvage works. *Geo. Wimpey & Co., Ltd. £56,940; garage, Rotton Park-st., salvage works. *T. Elvins & Sons, Ltd. £26,170; 16 dwellings, 4 garages, Shirley-rd., Hall Green. *Hunt & Pearcey, Ltd. £27,336; 16 dwellings, Prince Albert-st., Bordesley Green. *Direct labour building department. £31,353; 198 dwellings and 19 garages, Ladywood redevelopment area, Unit 208. *Geo. Wimpey & Co., Ltd. £477,237; Shelton Heath comprehensive sch.—Phase III—heating, hot water supply and cold water services. *Richard Crittall & Co., Ltd. £13,763.

Bishop Auckland.—134 houses at Woodhouse-close estate, for UDC. S: J. Ford. *E. Pye & Son, East-Parade, Bishop Auckland, 68 houses. *Bell & Ridley, Ltd., North-rd., Durham, 66 houses.

Cheltenham.—54 dwellings at Malvern-st. for BC. Boro' S. *Five Oaks Estates, Ltd. £75,980 (subject to Ministry approval).

Consett.—35 houses at Ebchester No. 2 housing estate, for UDC. S: E. Simpkin. *Direct labour.

East Ham.—44 flats in one r.c. framed eight-storey block at High-st. South/Central Park-rd., for BC. Chief Housing Officer, Town Hall. *Thomas Bates & Son, Ltd., The Old Brickworks, Harold Wood, Romford, Essex. £112,700.

East Tanfield (Co. Durham).—Pithead baths at East Tanfield Colliery, for NCB (No. 6 Area), Medomsley. Plans by the Area A. *C.T.C. (Builders), Ltd., Blackhill, Co. Durham.

Gateshead.—Roads and sewers at Lyndhurst estate, for TC. Boro' E: G. F. Winters. *Direct labour. £13,050.

Jarrow.—Alterations and extensions to grammar school, for Durham CC. *George Bambridge, 205, Westgate-rd., Newcastle-on-Tyne. £156,987.—RC church, York-ave. *A. Gunning & Co., Hannington-st., Newcastle-on-Tyne.

Lanchester.—30 houses at Burnhope, for RDC. S: J. A. Routledge. *Direct labour.

London.—For the erection of a block of offices, etc., in Upper St. Martin's-lane. Basil Spence & Partners, architects, Canonbury-place, N1. *Bovis, Ltd., Stanhope-gate, W.

¶London (Air Ministry).—New works contracts to value of £500 or over for week August 30:—*Building work*: Chilmark (Fovant), Wilts, E. J. G. Morgan, Ltd., Western Area Depot, Hilperton, nr. Trowbridge, Wilts. *Civil engineering*: Gan and Hittadu, Maldive Islands, Richard Costain, Ltd., 111, Westminster Bridge-rd., SE1. *French drainage*: Chelveston, Northants, William Sindall, Ltd., Gloucester-st., Cambridge. *Artificers' work*: Waterbeach, Cambridge, Kerridge (Cambridge), Ltd., Sturton-st., Cambridge.

London (British Railways).—Contracts placed by Eastern Region:—Donald Humberstone & Co., Ltd., North Somercotes, *Louth, Lincs,* for cleaning and painting of station buildings, signals, signal box, point rodding, bond warehouse, grain warehouse, workshops, offices, motive power depot, station footbridges, etc., at Lincoln Central Station.—R. Ridd & Son (Contractors), Ltd., 153, Billet-la., *Hornchurch, Essex,* for cleaning and painting of ironwork and steelwork to overhead line structures, between Liverpool Street and Shenfield.—F. Hodgson & Son, Ltd., Orchard-st., *Chelmsford,* for construction of overhead line maintenance depot at Pitsea.

London (British Transport Commission).—Contracts placed recently by the North-Eastern Region are:—*Dunston East Staiths*: New high dolphin, etc., Dowsett Engineering Construction, Ltd., Gateshead-on-Tyne. *Skinninggrove*: 70 ft. turntable pit, A. Robinson (Contractors), Ltd., Middlesbrough. *Shaftholme Signal Box*: Fabrication and erection of steelwork, Ward Bros. (Sherburn), Ltd., Malton.

London CC.—Erection of two 11-storey blocks in r.c., comprising 120 maisonettes and 8 flats, at Squirries-st. site, Bethnal Green. *Rush & Tompkins, Ltd. £325,000.

¶London (Metropolitan Police).—Tenders for building work:—Reinstatement as section house, Beak-st, London, W. T. Ricketts & Sons, Ltd., £1,963; ext. pntg., Trenchard hse., London, Druce & Co., Ltd., £789; ext. pntg. and repairs and part int. redecs., Bow district Garage, Druce & Co., Ltd., £859.

¶London (MoW).—Contracts placed for week ended August 24:—*Cardiganshire:* Ministry of Supply, Constitution Hill, Aberystwyth, new observation post, Isaac Jones (Llanelly), Ltd., Temple Works, Llanelly Carmarthen. *Glamorganshire:* Customs & Excise, Waterguard Offices, Roath Dock Basin, Cardiff, alterations and additions, E. J. Smith & Co., 43, James-st., Cardiff. *Hertfordshire:* Telephone Repeater Stn., Eywood-rd., St. Albans, erection of garages and provision of hardstanding, F. Bracey (Roads), Ltd., 28, Market-st., Watford. *Lancashire:* Customs and Excise, Sandon Dock, Liverpool, new office, J. Tomkinson & Co., Ltd., 22, Roscommon-st., Liverpool 5. *London:* Armour & Union House, St. Martin's-

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¶**London (War Dept.).**—Works contracts placed in week ended August 23.—*Co. Down:* Underground cables, B. French, Ltd., Belfast. *Hampshire:* Painting, Architectural Decorators, Ltd., London; Painting and decorating, George Jones & Son (Contractors), Ltd., London. *Isle of Wight:* Roadwork, W. & J. Glossop, Ltd., London. *Lancashire:* Electrical, Harry Bibby & Co., Ltd., Warrington. *Merionethshire:* Miscellaneous, Geo. Middleton & Sons, Towyn. *Pembrokeshire:* Electrical, The Colston Electrical Co., Ltd., Bristol.

Malden and Coombe.—12 flats Potters gr. for BC. Boro' E&S. J. Apse. *Omer & Wright. Reigate-ave., Sutton, Surrey, £17,418.

Manchester.—Works for City C:—33 dwellings at Hall-la., Wythenshawe. *J. Smith (Hale), Ltd., Altrincham.—26 dwellings at Herbert-st., Newton Heath; 38 dwellings at Gordon Mount and 29 dwellings at Withington and Wilbraham-rd. *Five Oaks Estates, Ltd., Wolverhampton. (All subject to approval of MH&LG.)

Monmouthshire CC.—Erection of grammar sch. at Croesyceiliog. *Rush & Tompkins, Ltd. £229,000. QS: Davis Belfield & Everest.

Newcastle-on-Tyne.—Warehouse, Blenheim-st., for E. Massey, Ltd. *Graham & Son, Forest Hall. £11,000.—Stores, for British Engines, Ltd. *R. Bowey & Son, Great North-rd., Newcastle-on-Tyne.

Newcastle-on-Tyne.—Garage and filling station on site of Wingrove bus depot, Westgate-rd., for Murray & Charleton, Ltd. A: Turley & Williamson (A/A), 46, Jesmond-rd., Newcastle. *George Bainbridge, Ltd., 205, Westgate-rd., Newcastle.

Ryton (Co. Durham).—54 houses at Heddon View estate, and 16 at Hexham Old-rd., for UDC. S: T. Charlton. *Direct labour.

Sedgefield.—12 bungalows at Ferryhill, for RDC. A: R. Dobson. *Direct labour. £13,326.

Shrewsbury.—Erection of crematorium, lodge and office at London-rd. for BC. Boro' S. A. T. Morris. Q.S. Henry Vale & Sons, Wolverhampton. *M. A. Boswell (Contractors), Ltd., Merridale, 124, Compton-rd., Wolverhampton.

Stanley (Co. Durham).—Addition to pithead baths at South Garesfield Colliery, for NCB. *Holland and Hannen & Cubitts, Ltd., Howdon-on-Tyne.

Wednesfield.—Eight bungalows and seven garages at Haden-cres., for UDC. E&S. 29. Bolton-rd. QS: H. Vale & Sons, Wolverhampton. *F. Tarks & Son, 42, Prestwood-rd. W., Wednesfield. £8,865.

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